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Digest

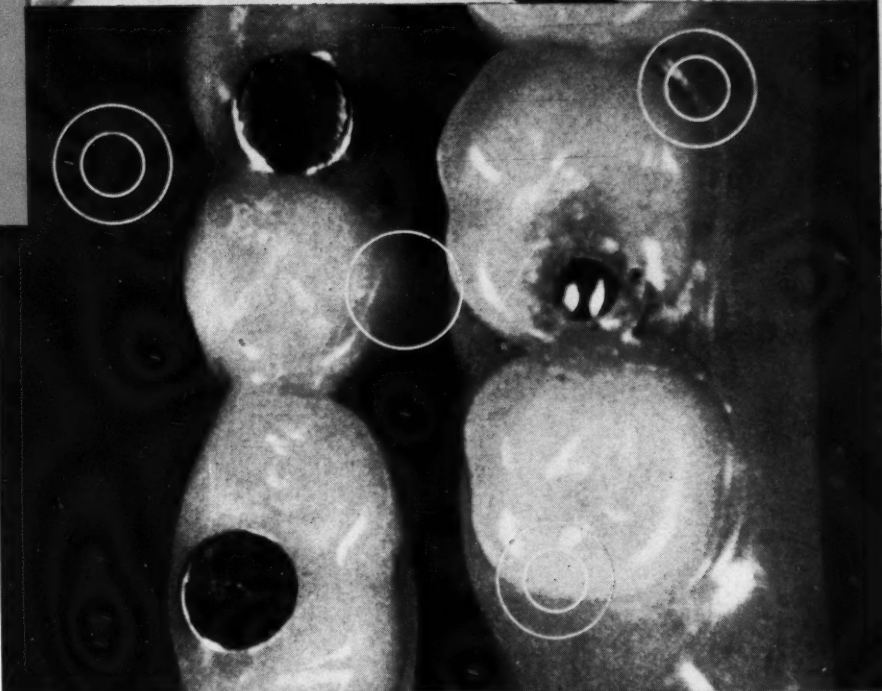
October 1955

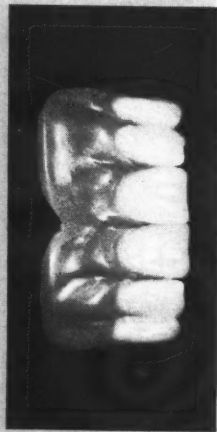
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This descriptive symbol simplifies tooth selection...

M42/C

M—MEDIUM LENGTH

42—WIDTH IN MILLIMETERS OF SIX

ANTERIOR CARD FLAT

C—DOMINANTLY "C" CURVED

LABIAL CHARACTERISTICS

SCHEMATIC DRAWING OF

FIVE-PHASE ANTERIOR CO-ORDINATE SIZE MOLD SYSTEM

WIDTH OF 6s CARDED FLAT	36 MM	39 MM	40 MM	42 MM	43 MM	45 MM	46 MM	48 MM	51 MM
LONG L	L36 C	L39 C		L42 C		L45 C		L48 C	L51 C
		L39 F		L42 F		L45 F		L48 F	
MEDIUM M	M36 C	M39 C	M40 C	M42 C	M43 C	M45 C	M46 C	M48 C	M51 C
		M39 F	M40 F	M42 F	M43 F	M45 F	M46 F	M48 F	
SHORT S		S39 C	S40 C	S42 C	S43 C	S45 C	S46 C	S48 C	
		S39 F	S40 F	S42 F	S43 F	S45 F	S46 F	S48 F	

FIVE FEATURES THAT ASSURE ACHIEVEMENT OF "LIVING" BEAUTY

1. You can select Five-Phase Anteriors with dominantly flat or dominantly curved labial characteristics.
2. You can transpose centrals, laterals and cuspids from different sets, when required—a feature that is unique to Five-Phase Anteriors.
3. You can use more than one tooth color in the same denture.
4. You can achieve maximum flexibility in tooth selection and arrangement.
5. You can select Five-Phase Anteriors in your choice of either Veri-chrome Porcelain or Verident Plastic.

Tooth selection can be simple and logical. Actual length, width and labial character required for each case automatically determine the Five-Phase Anterior mold to specify.

Five-Phase Anteriors are arranged in the Co-ordinate Size Mold System shown on this schematic chart. As you can see, standard sets are available in a choice of dominantly flat (F) or dominantly curved (C) labial character . . . in a full range of widths from 36 mm to 51 mm (the measurement of the six anteriors carded flat) . . . in long, medium and short molds.

In addition, the system is extremely flexible. The proximals of all Five-Phase Anteriors are co-acting. Choose from carded sets with the individual labial characteristics required or transpose teeth from different sets to create personalized dentures. The logical, orderly arrangement of the Five-Phase Coordinate Size Mold System makes this so easy to do.

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OCTOBER 1955**About Our****CONTRIBUTORS**

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708 Church Street, Evanston, Illinois

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BALL-POINT

Balanced Occlusion

ARTHUR C. JERMYN, D.D.S., Rochester, New York

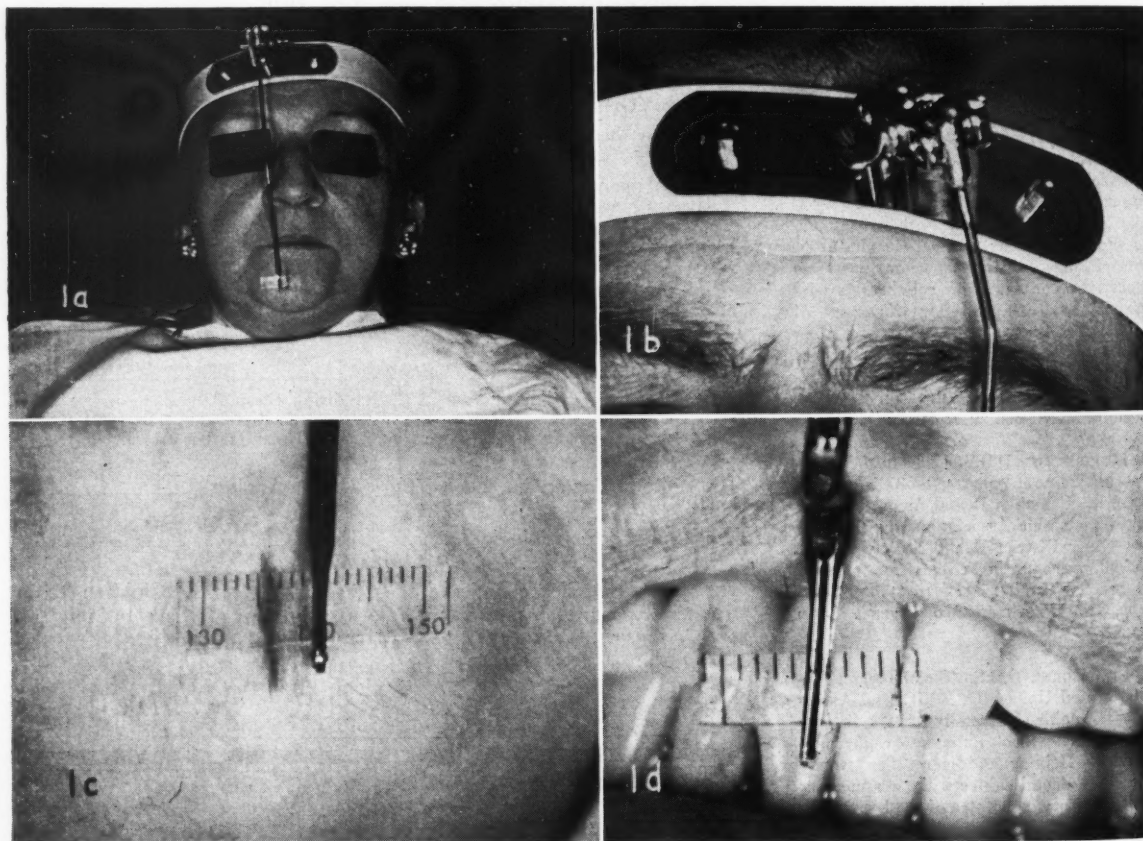
DIGEST

Detailed studies of mandibular movements during mastication with the use of multiple exposure movies and a specially designed movement indicator led to the conclusion that to preserve the bone underlying dentures a flat plane of occlusion is necessary (Figs. 1a, 1b, 1c, and 1d).

Additional study revealed that even a flat plane of occlusion was not the perfect answer because the greater area of contact with a flat occlusion produced friction between the opposing teeth. This led to the observation that real perfection would be found in placing ball-bearings in the occlusion of dentures. This is ob-

viously impractical. It was decided that point-to-plane occlusion should be used, such as a ball skidding on a flat surface (Fig. 2). The placement of these ball-points in the posterior occlusal surfaces stabilizes the dentures, relieving all stress on the anterior maxilla.

It was also evident that the ideal articulator would be the patient himself which led to the present method of having the



1A. Full view of the movement indicator designed to demonstrate mandibular movements with no deterring factors.

1B. Close-up view of swivel attachment of the movement indicator.

1C. View of the celluloid ruler on the tip of the movement

indicator. The ruler does not touch the chin and any markings on the chin show through for examination.

1D. View of the accessory indicator arm with the celluloid ruler for determining the movement of the dentures during mastication.

patient establish his own condylar path. The teeth that have been processed on the dentures are basically only establishing the correct vertical dimension with some reasonable resemblance to centric relation. The teeth themselves become the esthetic members of the dentures and serve merely to hold the balancing and mastication stainless steel counterparts.

The adoption of this technique in its entirety is not advocated as the intraoral procedures are extremely detailed and time-consuming, making the complete intraoral method economically impractical.

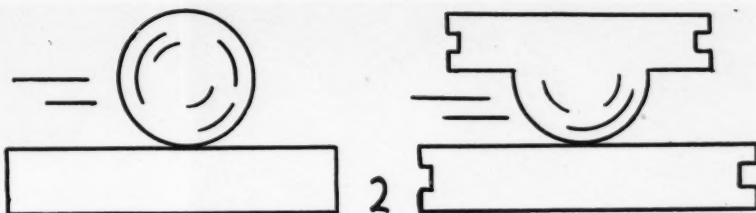
Since its inception the steps in the procedure have been shortened and a laboratory method devised whereby after complete milling of the teeth in the mouth the stainless steel inserts are placed by the laboratory technicians, saving both time and expense and giving the desired results.

Intraoral Technique

Dentures are constructed using sound prosthetic principles and using plastic teeth. When setting the teeth for these dentures in the laboratory it must be borne in mind that the metal inserts are going to be used in the posterior teeth, and therefore, vertical pressures should be borne by them and should be directly over or within the ridges. The inserts are to be enclosed in the teeth, allowing the buccal surfaces of the teeth to be only façades. Cusps should be ground flat in the laboratory to save time at the chair. The bite is left open about 1.2 millimeters to allow grinding in the mouth.

Occlusion Balanced—1. The cusps are ground in the mouth with the use of a Coble Balancer.¹

2. The cusps are further ground by using "Wet or Dry" emory cloth No. 220 and No. 320, manufactured by Minnesota Mining and Manufacturing Company. The paper is cut so that it covers the posterior teeth and



2. The least amount of lateral resistance is found in a ball rolling on a flat surface, as on the left. A ball skidding on a flat surface offers less resistance to lateral displacement than other forms of flat occlusion.

extends buccally about 3/8 inch beyond the teeth to allow a lip for holding the paper securely.

3. The patient is instructed to grind laterally with the dentures, thereby grinding down the occlusion until all cuspal interference is eliminated and a condylar path is started according to the patient's own specifications (Fig. 3).

Discrepancies Corrected—1. For additional correction of the discrepancies in this condylar path and to establish a true incisal guide path, wax is softened and placed upon the posterior teeth of the upper denture.

2. Keeping the wax soft, the patient is instructed to close into the wax, first in protrusive, and then sliding back into centric, and then into both right and left lateral excursions until the point of first contact of the teeth is felt.

3. Where the wax is torn, it should be remelted and flowed on these

areas. The excess wax on the buccal and lingual surfaces is now carved away (Figs. 4a and 4b).

Corrections in Upper Wax Plane—1. Utilizing the properties of the autopolymerizing plastic to set in the mouth while the mandible is in movement, place wax as a matrix on the buccal and lingual surfaces of the lower denture.

2. A mix of the proper shade of plastic is placed into the wax matrix over the teeth of the lower denture.

3. A resin strip is placed on the soft mix and the denture is returned to the mouth.

4. The patient is instructed to close first in protrusive, then into centric, and finally to slide into both right and left lateral excursions, thereby duplicating and making slight corrections to the upper waxplane.

5. In approximately three minutes, when the plastic has set, the lower denture is removed and excess plastic



3. Use of emory paper to grind occlusion flat according to the patient's own condylar guide path preparatory to further correction.

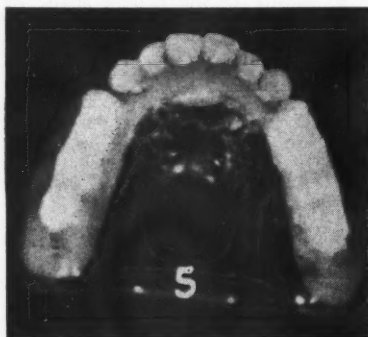
¹Coble, Lucien G., Suite 330 Jefferson Building, Greensboro, N.C.



4A. Impression of the lower teeth in wax luted on the teeth of the upper denture.



4B. Carving off excess wax from buccal and lingual surfaces and carving down to plane of first contact. Correct vertical is also established in this step.



5. Appearance of the upper denture with self-curing plastic adhered to the occlusal surfaces of the teeth.

is ground away from both the buccal and lingual sides of the teeth, allowing the plastic to remain adhered to the occlusal surfaces.

Corrective Procedure Repeated—1. The wax is removed from the upper denture, and the occlusal surfaces of the teeth are cleaned.

2. Using a new mix of the correct shade of plastic, repeat the same procedure by placing resin strips between the teeth and having the patient close and make the same excursions.

3. The plastic on the upper denture teeth is now ground away on the buccal and lingual surfaces leaving plastic adhered to the occlusal surfaces (Fig. 5).

4. Upper and lower dentures are provided with flat plastic planes of occlusion which exactly duplicate the patient's actual condylar and incisal guide paths.

5. There has been no displacement of the dentures due to excessive pressures such as in grinding. The lateral movements were free and there was no distortion of the underlying tissues.

Ball-points Placed in Upper Denture—1. There are four ball-points, shaped like a hemisphere on a flat base (Fig. 6). Places are chosen on the upper denture for placing, usually

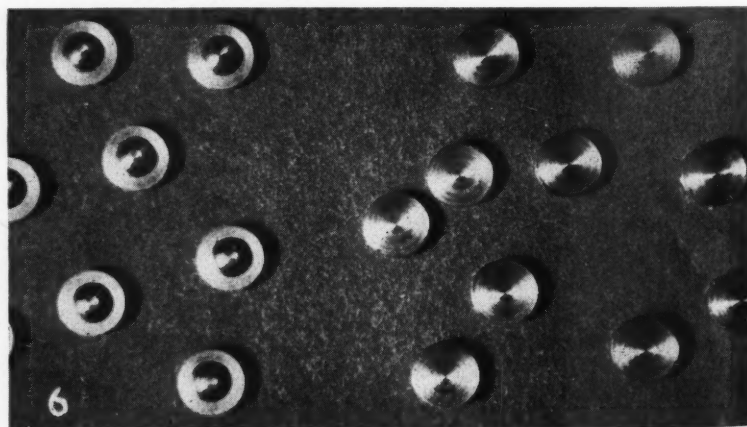
in the area of the distal sulcus of the first bicuspid and the mesial sulcus of the second molar.

2. Using a No. 2 rose bur, drill in at right angles to the plane of occlusion of the plastic.

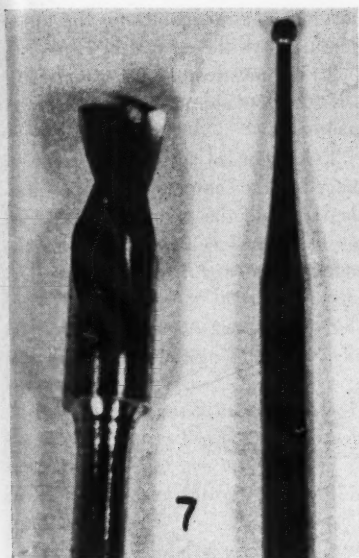
3. Using a specially made drill of the correct diameter to accommodate the ball-point drill into the guide holes to a depth exceeding the height of the ball-point with its base (Fig. 7).

4. At least two sluiceway slots are drilled with a crosscut fissure bur for the escape of excess plastic.

5. The ball-points are then inserted into the holes with self-curing



6. Magnified view of ball-points on the left and flat occlusion planes on the right. The material is stainless steel.



7. Specially made drill and No. 2 rose bur used to drill holes.

plastic of the proper shade and the correct depth is secured by having the patient close onto the lower plastic bite plane with a strip of resin between.

6. After the plastic has set, excess material is ground away.

Location of Holes—The question now is where to drill the holes into the plastic plane of the lower teeth to place properly the stainless steel flat planes (Fig. 6).

1. Using an indelible pencil, wet and mark the tips of the ball-points on the upper, and have the patient close, moving into both right and left lateral excursions and into protrusive, thereby making Gothic arch tracings on the plastic plane of the lower denture (Fig. 8).

2. The apex of the arrowheads formed by the tracings shows the exact centric and also the center of the round flat planes.

3. Repeat the drilling operation, using a No. 2 rose bur, followed by the special bur. Place the sluiceway slots.

4. With self-curing plastic place the steel flat planes. No resin strips are used at this time.

5. The patient closes into centric and slides into both excursions.

6. The flat planes are in correct vertical and centric and may be tipped slightly as the correct condylar path is exerted upon them as the ball-points slide upon them.

Esthetic Appearance Returned—After the plastic is completely hardened, excess material is cut away and the flat planes of plastic are ground and reformed so that the esthetic appearance of the teeth is again assumed (Fig. 9).

Problem of Wear from Mastication

After patients had worn dentures

with these ball-points for a period of six months and were recalled to the office it was noticed that the teeth, for example, second bicuspid and first molars which had no stainless steel parts in them, had worn down from mastication so that a space of $\frac{1}{2}$ to 1 millimeter existed. Plastic teeth do wear down, causing a loss of vertical dimension. There was no appreciable wear in the ball-points and flat planes. It was decided that other steel counterparts should be placed in these areas of wear.

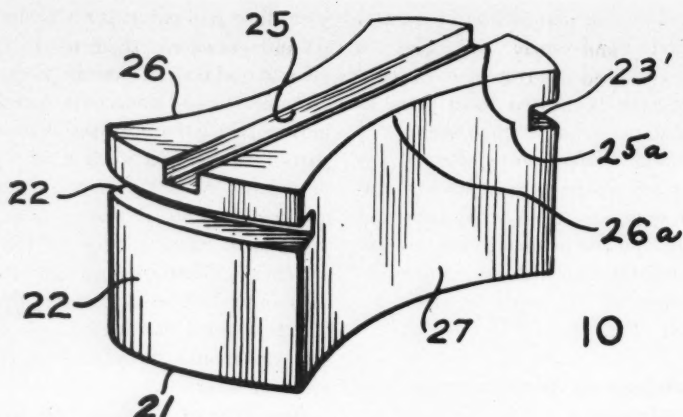
New Type of Masticator Devised—Since all methods of balancing were



8. Lower denture showing Gothic arch tracings to determine drilling points for the stainless steel flat planes.



9. Magnified view of ballpoint placed in upper denture on the right and flat planes in lower denture on the left.



10. Schematic drawing of a single stainless steel masticator. Nos. 22 and 23 are retaining slots in the main body, No. 27. Nos. 24 and 25, 25a and 26a are the four cutting edges to each masticator.

intraoral, a new type of masticator had to be devised in order to process the counterparts into the teeth after all balancing was completed. The masticator should be small and should be esthetically approved. None of the masticators on the market being entirely satisfactory, it was decided to turn to the principles of physics and evolve a new type.

Description of Masticators—Similar to the shearing action of the curved blades of a hedge shears, the present masticators were designed by the author (Fig. 10). Small in size, only $\frac{3}{16}$ of an inch in diameter, they were nevertheless efficient. There are 16 cutting edges to each opposing pair of masticators, four in each quadrant. When placed in the teeth of dentures, one above the other, turned on their axes at right angles to each other, each quadrant has four cutting edges $\frac{3}{32}$ of an inch in length. With all 16 cutting edges multiplied by $\frac{3}{32}$ inch, the result is one and half ($1\frac{1}{2}$) inches of cutting edge to each pair of masticators. With two pairs on each side there are theoretically three (3) inches of cutting edge in the space of the bicuspid and molar (Fig. 11).

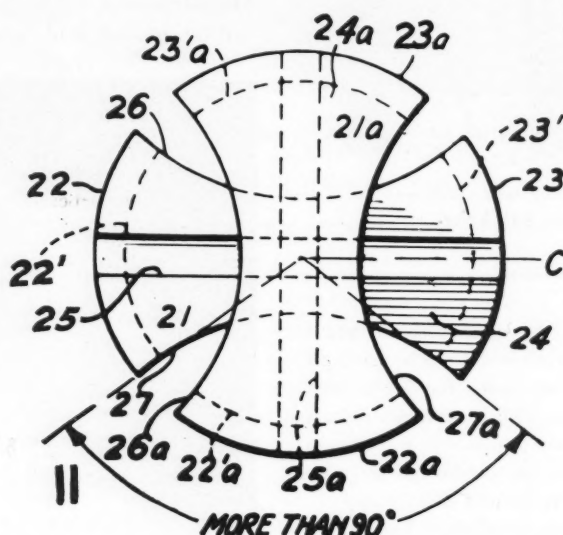
Method of Placing Masticators—1. Holes are drilled in the second bi-

cuspid and first molars on the upper denture with the special drill.

2. The masticators are seated using self-curing plastic down to the line of occlusion.

3. A spot of disclosing paste is placed in the center of the upper masticators, and the patient is instructed to close into centric, revealing the center point for the lower masticators.

4. The upper masticators are usually placed longitudinally with the



11. Schematic drawing of masticators placed one above the other as in dentures, turned on their axes at right angles to each other, showing the effect of four cutting edges in each quadrant. Two pairs on each side give three (3) inches of cutting edge to each side.



12. Finished full upper denture and full lower implant denture with ball-points, flat planes, and masticators. Plastic posterior teeth serve only for esthetic purposes and for retention of stainless steel balancing and mastication counterparts.

teeth, and the lower masticators are placed transversally. This is a matter of choice (Fig. 12).

5. Final polishing of the denture is done before returning them to the patient.

Summary

The detailed study and method described proved over a two-year period that there existed a better balanced and frictionless occlusion, which helped to preserve the underlying tissues.

The stainless steel counterparts in the teeth give less horizontal and vertical trauma, and are vastly more efficient for mastication than other teeth.

There is no loss of vertical dimension that is encountered in plastic teeth alone.

There are more and better food exits and escapes. There is a decrease in the amount of surface contact, and the distribution of stresses is limited only to the centric.

There is harmony of guiding inclines, eliminating disturbing eccentric excursions.

Occlusal stresses are favorably applied vertically to the supporting tissues.

There exists a more pleasing esthetic appearance in both ball-points and masticators because they simulate polished amalgam restorations.

Conclusions

Since the intraoral technique described uses an excessive amount of chair time the procedure may be modified to make it more practical and economical in general practice:

1. After milling the teeth to flat planes and using the Coble Balancer to establish centric, a plaster check-bite is taken and the dentures are remounted on the articulator.

2. The ball-points and masticators are then processed into the teeth with self-curing plastic in the laboratory. This gives excellent results, not quite as accurate, but serving all practical

purposes, and gives a better balanced occlusion than with all other tried methods.

Stability Retained—With the use of these ball-points and masticators a two-year study shows that dentures retain their stability and show no loss of retentive factors. They remain completely tight and show no horizontal movement, even in eccentric excursions. The tissues exhibit a much healthier tone with less discomfort or irritation. The normal fluid content of the tissues seems to remain undisturbed.

The author is utilizing these ball-points and masticators in all conventional dentures and also in implant dentures. The extra steps involved help guarantee a good prognosis for implant dentures and lessen the likelihood of bone loss under conventional dentures, which leads to implant dentures.

920 Winton Road South

Exposure to Fluoride Dust

Query

A man was exposed to heavy concentration of fluoride dust while sifting fluoride before adding it to a hopper to be added to the city water supply. This exposure occurred in 1952 and gave him symptoms of hepatitis and pain in the liver region at the time. Following the exposure preventative [sic] and protective measures were instituted, but each summer during the heavier demands for water and when the air was dry his symptoms would recur. He has finally been removed from the job. X-rays of the bones are normal, and liver function studies are normal, but he continues to have vague symptoms of indigestion and pain in the liver region at times. X-rays of the gastrointestinal tract and gallbladder are normal. There was no previous history of hepatic disorder. What are the possibilities of future liver disease, and

how could one arrive at any idea of permanency of injury for compensatory purposes?

Answer

In true chronic fluoride poisoning the characteristic manifestation is increased density of bony and tendinous tissues as revealed by x-ray examination. This change ordinarily will not arise in the absence of prolonged, persistent exposure. In acute poisoning, whether by inhalation or ingestion of the fluoride, digestive disturbances often are prominent. Although not characteristic, pain in the liver region has been reported. Thus Roholm observes that about half of cryolite workers complained of lack of appetite, nausea, and shortness of breath and that a smaller proportion mentioned constipation, localized pain in the region of the liver, etc. Galeazzi, in 1948, reported a high

frequency of liver damage in a region of endemic fluorosis. It would appear reasonable to believe that this patient may have suffered one or more acute episodes as noted in the query, but it may be unlikely that any present-day, vague symptoms of indigestion and pain in the liver region may represent a continuation of this disease to the present time. The absence of all bony changes as revealed by the x-ray supports this attitude. Should laboratory facilities be available for the study of enzymatic systems, some precise information might be gained through the measurement of the level of salivary amylase, peroxidase, cholinesterase, and urease. Many enzymes are known to be inhibited by fluorides.

From Queries and Minor Notes, *Journal of the American Medical Association* 158: No. 7, 623 (June 18) 1955.

Location and Removal of a BROKEN NEEDLE from the Maxilla

ROBERT A. ATTERBURY, B.S., D.D.S.,
and SUNDER J. VAZIRANI, D.D.S., Oak Park, Illinois

DIGEST

Much has been written on the localization and removal of hypodermic needles from the deep tissue areas of the lingual surface of the mandible, but little on those broken and lost in the maxillary tuberosity area. The surgical removal of a broken hypodermic needle in the maxilla, especially after a tuberosity injection, is not a simple procedure. The most difficult problem is the location of the exact position of the needle fragment.

There have been cases where the needle remained embedded in the tissue without apparent complications, but immediate location and removal of a broken needle which may cause complications later is the operator's responsibility. This article illustrates a step-by-step procedure for the surgical removal of a needle fragment.

Report of a Case

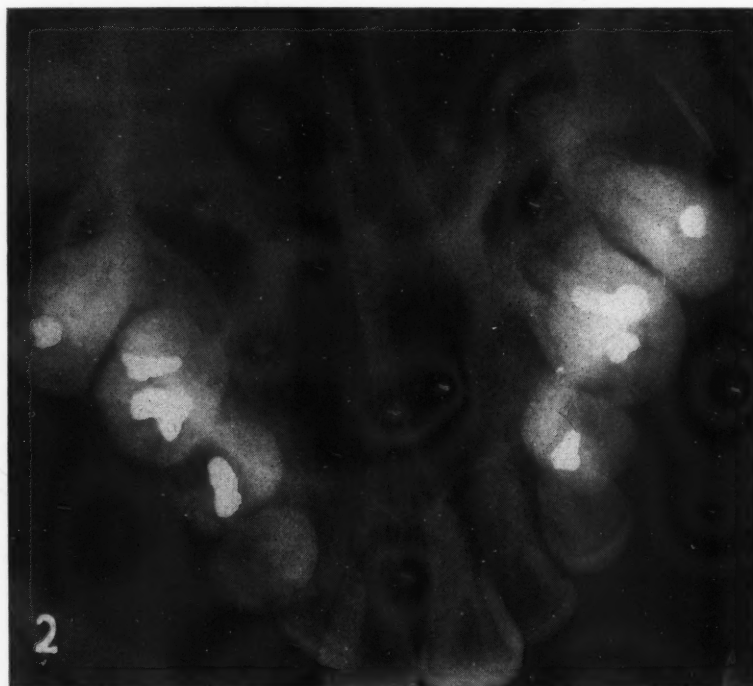
A woman, aged 26, was referred by psychiatric service for routine consultation. She was hospitalized for psychiatric observation.

At the time of examination the patient stated that she had a left maxillary impacted third molar surgically removed some two and a half years previously when she had experienced considerable pain and had a difficult postoperative course.

Clinical examination revealed average oral hygiene and several carious teeth.



1. Showing needle fragment in left maxillary tuberosity area. Lateral view.



2. Revealing the relative position of the broken needle to the alveolar maxillary ridge. Occlusal view.

Radiographic Examination—A lost needle fragment, one centimeter long, was revealed in the left maxillary tuberosity area (Fig. 1). Additional radiographs disclosed the exact position of the needle fragment with relation to the bone. These additional radiographs are important although in this instance the exact position of the broken fragment seemed assured.

Localization Procedure—To obtain information for localization, specific radiographic views were necessary. These views also revealed the type, length, and gauge of the broken needle fragment and its approximate point of insertion:

1. The first view (Fig. 1) was ob-



3. View with guide needle to aid in localization.

tained by placing a dental film parallel to the long axis of the maxillary teeth.

2. The second was an occlusal view (Fig. 2). The film was placed in the mouth at right angles to the long axis of the maxillary teeth. The roentgen rays were directed from above the head downward. This view reveals the relative position of the broken needle to the alveolar maxillary ridge.

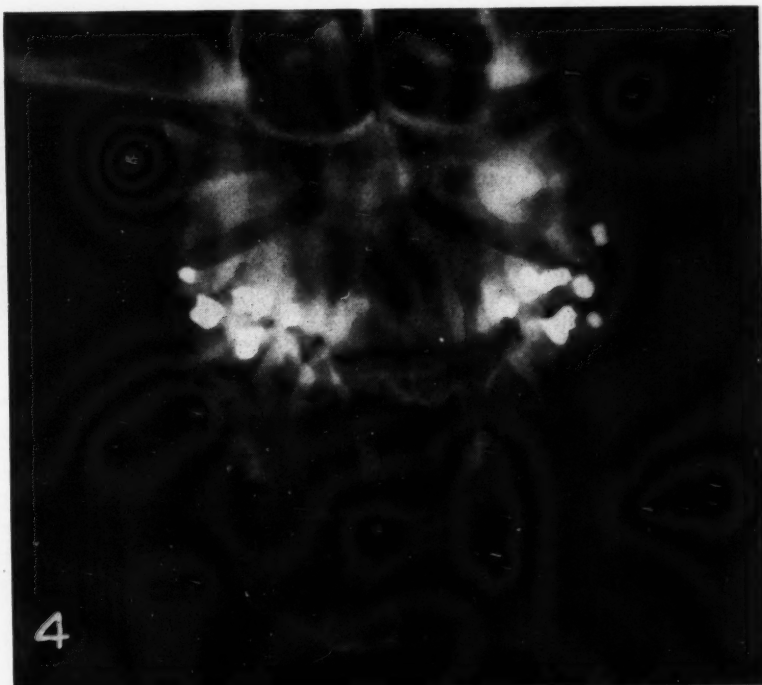
3. To localize the object more specifically, another lateral view (Fig. 3) was taken with a guide needle or finder inserted as close to the lost fragment as possible. Care was taken not to strike the fragment and drive it deeper into the tissue. Information gained from this view was helpful in planning the initial incision.

4. The posteroanterior view (Fig. 4) and lateral view (Fig. 5) provide the operator with anatomic landmarks of the site.

Position of Fragment Visualized— Several radiographic views aid in creating a mental image of the approximate position of the lost fragment and in planning the initial incision. They also preclude unnecessary dissection and seaching and will act as a more positive aid in the definite recovery of the broken needle fragment in the maxillary area.

Anatomic Consideration of the Space

In this case the area involved is bounded anteriorly by the maxillary



4. The anteroposterior view aids in revealing anatomic landmarks and as a more positive aid in the definite localization of the broken needle fragment.

5. The lateral view is an additional aid in determining a mental image of the approximate position of the lost needle fragment and in planning the initial incision.

tuberosity, medially by the external pterygoid plate, and superiorly by the infratemporal fossa.

Anterior Boundary—The outer surface of the maxillary tuberosity and the labial surface of the alveolar process above the molar teeth serve as bony areas of attachment for the buccinator muscle. A few of the lower fibers of the internal pterygoid muscle also arise from the maxillary tuberosity. In some persons the tuberosity may be formed by a thin bony wall due to the outspreading of maxillary sinuses within. Preoperative x-ray examination is therefore of diagnostic importance.

Medial Boundary—The fibers of the lower head of the external pterygoid muscle also arise from the remainder of the outer space of the lateral pterygoid plate.

Superior Boundary—This is an important area containing (1) pterygoid plexus of veins, (2) arteries, (3) lymphatics, and (4) nerves. This area should be given consideration because it can contribute to postoperative complications.

Surgery

The patient was premedicated with demerol®, 50 milligrams, and atropine 1/150 grain, half an hour prior to surgery. The areas were anesthetized with 2 per cent xylocaine®, and 1:100,000 epinephrine local anesthesia. The nerves involved were the infraorbital, postauricular, and the anterior palatine nerve through the greater palatine foramen.

Vertical Incision Made—Using a



6. Postoperative view showing absence of hypodermic needle fragment.

No. 15 blade, a vertical incision 2½ centimeters long was made through the outer aspect of the maxillary tuberosity following the gingival labial contour and carried along the second molar area. The mucoperiosteum was reflected from the external maxillary plate to reveal the muscular structure in the tuberosity region.

Position of Fragment Determined

—The tissues were reflected by blunt dissection. The buccinator and external pterygoid muscular fibers were separated by careful dissection. The proximal position of the needle, which was embedded in the fibrous capsule, was localized.

Fragment Withdrawn—The fragment end was grasped with a curved hemostat and withdrawn from the tissue in a downward and forward direction. The mucoperiosteal flap was approximated and closed with 0000 nylon suture material.

Examination of the fragment revealed that it was part of a hypodermic needle somewhat rusted.

Postoperative Course

Recovery was uneventful:

1. The patient received 600,000 units of penicillin intramuscularly for three days.
2. For pain, the patient was given analgesic with codeine, if needed, every four hours.
3. Warm saline oral rinses.
4. Cold application over the area for four hours.
5. Sutures were removed in five days. Postoperative x-ray views showed the absence of the hypodermic needle fragment (Fig. 6).

Comment

This case report emphasizes the importance of anatomic knowledge of the region to be anesthetized. The value of roentgenograms cannot be overstressed. Both small intraoral and occlusal views supplemented with posteroanterior and lateral views are necessary to discover the exact position of a broken hypodermic needle.

In the event that a needle has been inserted and broken in an area remote from the usual tuberosity site, a radioopaque finder may be placed in the tissue in the approximate location of the broken needle. The finder, which may be another hypodermic needle with a knob or hub on the end, should remain in place throughout the operation.

Needles, when broken, should be located and removed at the earliest opportunity.

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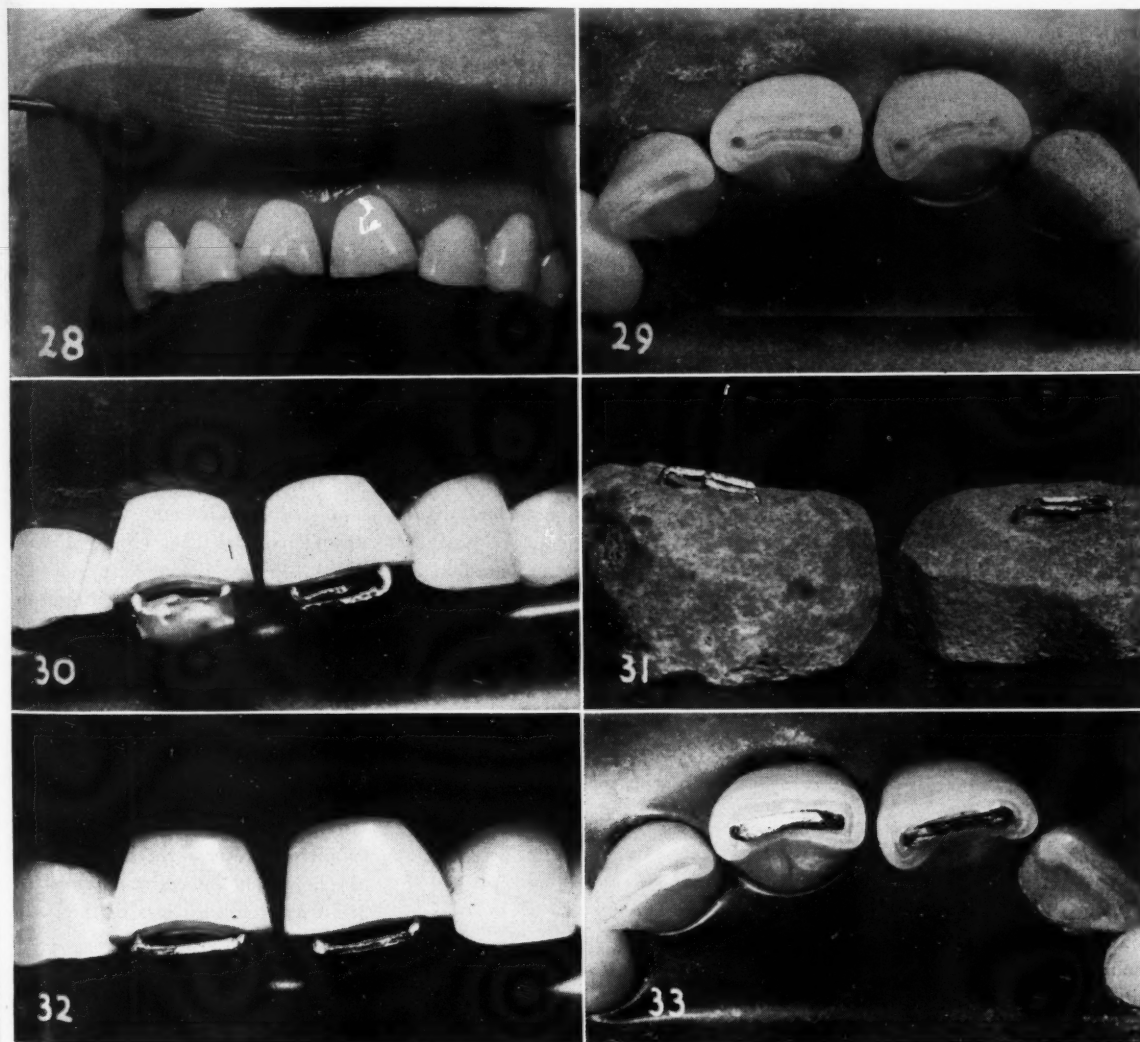
Employing Prefabricated

Tapered Gold Pins—Part Two

M. M. CHECHIK, D.D.S., Vancouver

DIGEST

This is the second of a two-part article presenting a detailed description of a technique based on the use of prefabricated tapered gold pins which fit precisely a hole prepared by a standard bur. Step-by-step directions are given for completing the procedure in five adaptations of the technique and each is fully illustrated.



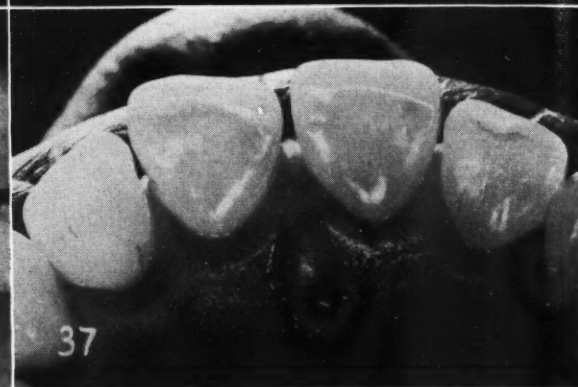
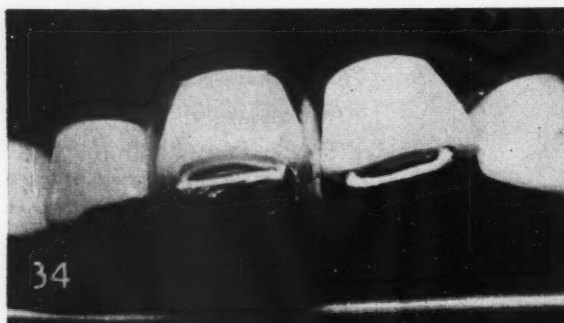
28. In Case Four enamel hypoplasia resulted in attrition of the centrals so that the teeth were considerably shortened.

29. Under the rubber dam the incisal edges were reduced to eliminate the irregularities on the labial and lingual cavosurfaces. Axial pinholes were prepared mesially and distally in each tooth with a 700 bur and the dentine was grooved along the incisal edges to increase retention.

30. Suitable pins were selected and bent at right angles in contact with each other. These pins were fused with sticky wax and reinforced with a piece of paper clip wire.

31. The pins were removed and invested for soldering.

32 and 33. The soldered pins were reduced in bulk and ground to follow the labial and lingual contour of the tooth. The pins were then cemented in place.



34. A window was prepared in the crown form.

35. The autoseal resin was mixed and flowed into the forms.

36 and 37. The restorations were dressed down and polished.

Case Four—Procedure to Restore the Incisal Edge of Centrals

In this case enamel hypoplasia resulted in attrition of the centrals so that the centrals were considerably shortened (Fig. 28). The following restorative procedure was completed:

1. Under the rubber dam the incisal edge was reduced to eliminate the irregularities on the labial and lingual cavosurfaces. Two axial pinholes were prepared mesially and distally with a 700 bur and the dentine was grooved along the incisal edge to increase retention (Fig. 29).

2. Suitable pins were selected and bent at right angles in contact with each other. These pins were fused with sticky wax and reinforced with a piece of paper clip wire (Fig. 30).

3. The pins were removed and invested for soldering (Fig. 31).

4. The soldered pins were reduced in bulk and ground to follow the labial and lingual contour of the tooth. The pins were then cemented in place (Figs. 32 and 33).

5. Opacifier was applied and crown forms were selected, placed in position over the tooth, and blocked with compound.

6. A window was prepared in the crown form (Fig. 34).

7. The autoseal resin was mixed and flowed into the crown (Fig. 35).

8. The restoration was dressed down and polished (Figs. 36 and 37).

9. X-ray view showing pins in the completed case (Fig. 38).



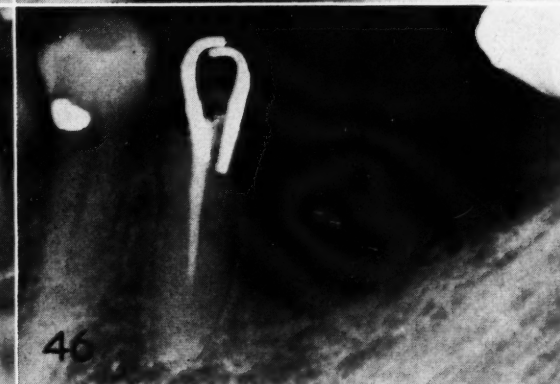
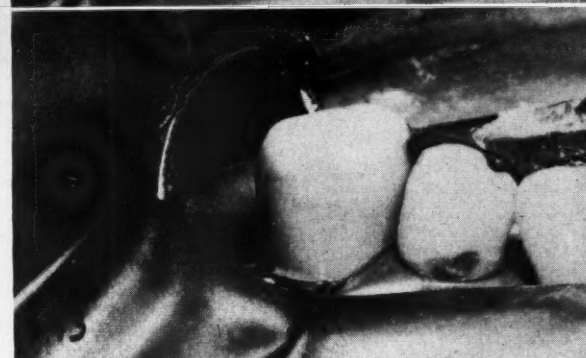
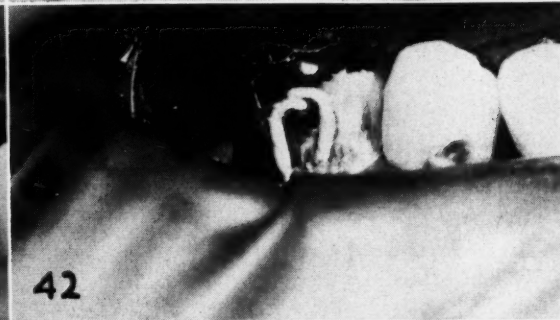
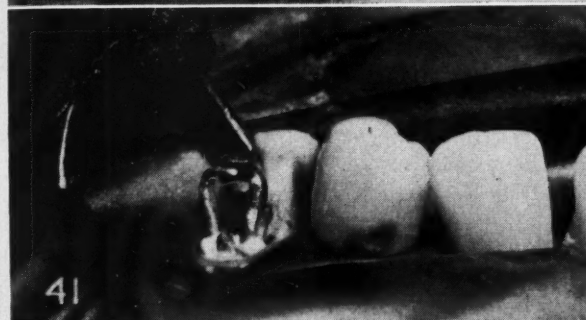
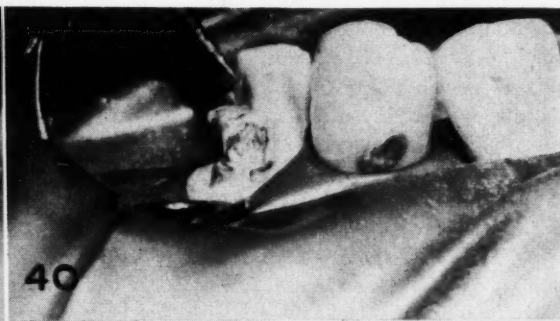
38. X-ray view showing pins in the completed case.

Case Five—Procedure to Restore MOD

This procedure which includes the entire buccal surface on the bicuspid, is applicable to both vital and non-vital teeth. The patient presented with a nonvital lower right second bicuspid in which the entire buccal cusp had fractured with loss of the MOD amalgam (Fig. 39). This restoration employed the following steps:

1. Under the rubber dam the tooth was prepared by squaring the margins and with a 700 bur preparing a pinhole parallel to the axial in the gingival floor on both mesial and distal aspects (Fig. 40).

2. Suitable pins were selected, contoured, and cemented into position (Fig. 41).



39. The patient in Case Five presented with a nonvital lower right second bicuspid in which the entire buccal cusp had fractured with loss of the MOD amalgam.

40. Under the rubber dam the tooth was prepared by squaring the margins and with a 700 bur preparing a pin-hole parallel to the axial in the gingival floor on both mesial and distal aspects.

41. Suitable pins were selected, contoured, and cemented into position.

42. A window was prepared by cutting out a section of the occlusal of the crown form.

43. The autoseal resin was mixed and flowed into the crown form through the occlusal opening.

44 and 45. The restoration was trimmed down and polished.

46. An x-ray showing the completed case. In this case the mesial pin appears to enter the root filling in the pulp chamber.

3. Opacifier was applied, a suitable crown form was positioned over the tooth and blocked with compound. A window was prepared by cutting out a section of the occlusal of the crown form (Fig. 42).

4. The autaset resin was mixed and flowed into the crown form through the occlusal opening (Fig. 43).

5. The restoration was trimmed and polished (Figs. 44 and 45).

6. Figure 46 is an x-ray view showing the completed case. In this case the mesial pin appears to enter the root filling in the pulp chamber (Fig. 46). This same technique can be used without encroaching on a vital pulp (Fig. 47).

Procedure to Plug Escape Hole in Full Cast Crowns

When it is necessary to provide an escape hole in cementing a full cast crown the following steps may be taken:

1. Before cementation the escape hole should be formed first using a small round bur.

2. When drilling through gold, countersink first with a one-half round bur and then use a round bur of a size less than the tapered fissure bur to be used. Employ the bur in a push and pull action to prevent the head of the bur locking into the gold and breaking off. When the crown is cemented and set, a tapered fissure bur of desired size can be used to form the preparation to receive the pin.

3. A prefabricated pin of corresponding size is readily fitted and cemented in position. It should be borne in mind that any discrepancy or looseness of fit may be compensated for by grinding off a portion of the smaller end of the taper which permits the pin to wedge further against the walls of the preparation. That portion of the pin extending beyond the crown is cut off and the end is ground and burnished. If this is carefully done no visible sign of the pin end can be seen.

4. Using this technique it is also possible to manage pit cavities which are found on the buccal of upper and lower molars and on the lingual of upper incisors and molars by using the prefabricated pin in the role of a prefabricated inlay.

Procedure to Increase Retentive Qualities

The retentive qualities of a gold restoration with insufficient retention can be increased in two ways:

First Method—To cement in one or more pins at various angles; for example, to cement in three pins on an anterior three-quarter crown take the following steps:

1. Locate the position of the pin-holes on the crown in relation to areas of sound dentine. The initial holes are prepared by countersinking with a one-half round bur. A round bur of a size less than the tapered fissure bur to be used is then employed to complete the initial hole.



47. This technique can be used without encroaching on a vital pulp.

2. When the crown is cemented and set, a tapered fissure bur of desired size may be used to form the preparations to receive the prefabricated pins.

3. The prefabricated pins of corresponding size are readily fitted and cemented in position.

4. Figure 48 is a view of the prepared tooth showing the pins and internal form of the casting with the pins in position at the various angles.

5. In Figure 49 is shown the casting seated with the pins in position at the various angles. These are cut off and polished.

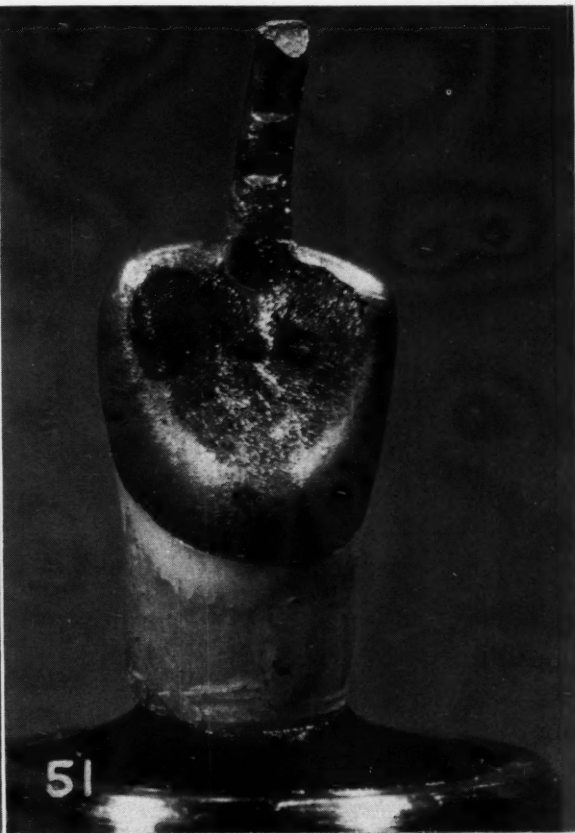
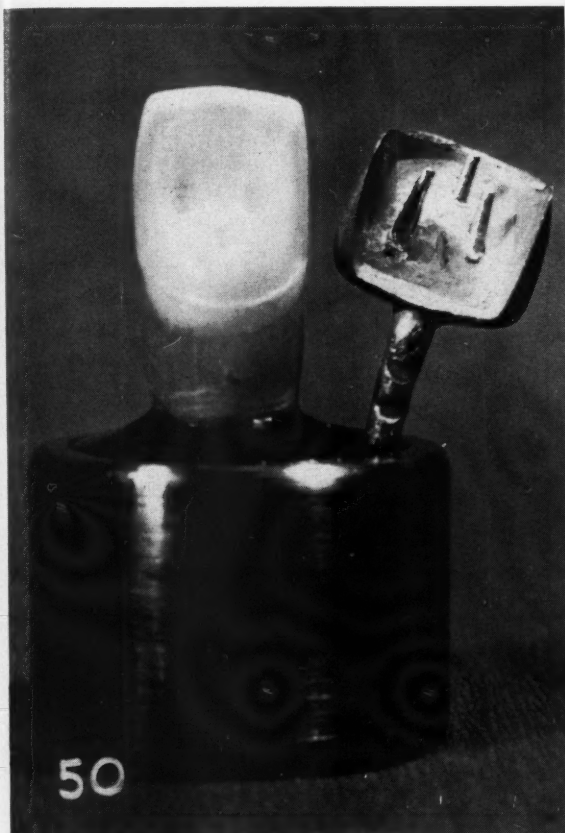
Second Method—To solder on one or more pins to simulate a pin inlay; for example, to solder in three pins on an anterior three-quarter crown the following steps are taken:



48. A view of the prepared tooth showing the pins and internal form of the casting with the pins in position at the various angles.



49. The casting seated with the pins in position at the various angles. These are cut off and polished.



50. A finished three-quarter crown to which three 700 pins have been added.

51. The lingual surface after the soldered area has been ground down.

52. In Case Six the pins are placed in position and invested for soldering.

53. The pins are soldered in position. Conversion from a simple three-quarter crown to a pinledge type three-quarter crown is shown.

1. Make initial holes as in the first method and seat the restoration without cementation.

2. Prepare only one pinhole parallel to the path of insertion of the crown and secure the restoration

with a pin of corresponding size.

3. With the restoration locked into position, complete other tapered pin-



54. An MO inlay showing a 702 pin in position. In this case the bridge was first cemented, the 702 pin was then inserted, cut off, and polished.

55. A bitewing x-ray shows the depth of the pin in a molar preparation.

56. In Case Seven a 702 pinhole is prepared in the root canal.

57. The bridge, invested with a 702 pin, is in position for soldering.

holes parallel to the original and place the pins.

4. Seal the pins to the preparation by wedging chips of sticky wax around the pins and flow with a hot instrument. Note that the lingual surface of the three-quarter crown should be roughened to increase adherence of the sticky wax.

5. The restoration may now be withdrawn from the preparation with the pins held securely since the pull of the withdrawal merely tends to secure the tapered pin more firmly in the tapered hole.

6. The crown is invested leaving the lingual surface exposed.

7. The pins are soldered, cut off and polished. A three-quarter crown which lacked retention has been converted to a completely retentive pinledge three-quarter crown.

8. A finished three-quarter crown

to which three 700 pins have been added is shown in Figure 50.

9. The lingual surface after the soldered area has been ground as shown in Figure 51.

Case Six—Procedure to Convert a Bridge with Insufficient Retention

By adding three 700 pins to the three-quarter crown and one 702 pin to the MO inlay in the molar, sufficient retention was supplied. The following figures illustrate the procedure:

1. The pins are placed in position and invested for soldering (Fig. 52).

2. The pins are soldered into position. Conversion from a simple three-quarter crown to a pinledge type three-quarter crown is shown in Figure 53.

3. An MO inlay showing a 702

pin in position is shown in Figure 54. In this case the bridge was first cemented, the 702 pin was then inserted, cut off, and polished.

4. In Figure 55 a bitewing x-ray shows the depth of the pin in a molar preparation.

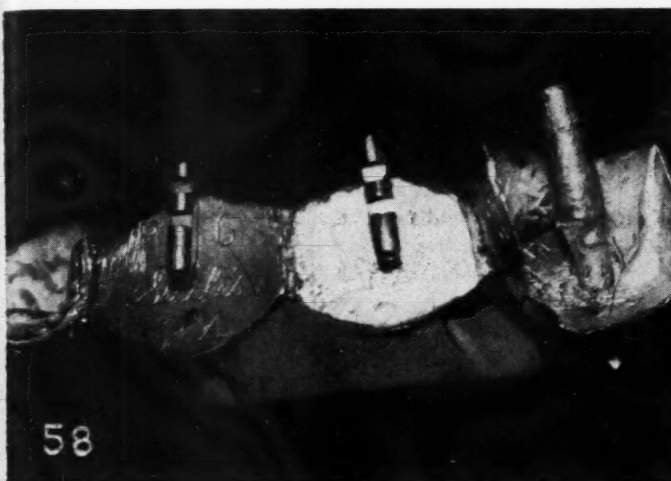
Case Seven

The procedure to add retention to a bridge after a three-quarter crown in a cuspid loosened by caries to the extent of pulpal involvement necessitated root canal therapy. The technique used is illustrated in the following figures:

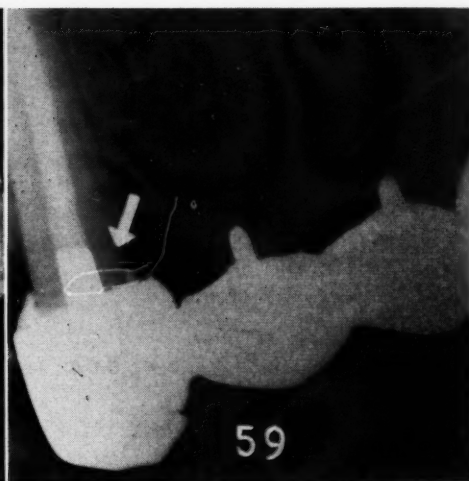
1. A 702 pinhole is prepared in the root canal (Fig. 56).

2. The bridge, invested with a 702 pin, is in position for soldering (Fig. 57).

3. The pin is soldered in position (Fig. 58).



58. The pin is soldered in position.



59. X-ray view showing the pin in position.

4. This x-ray view shows the pin in position (Fig. 59).

Advantages of the Technique

(a) The operation is completed in one sitting.

(b) The substantial reduction in operating time makes it possible to provide the patient with a functional

restoration at a correspondingly reduced fee.

(c) Complete restoration of esthetic qualities.

(d) Conservation of tooth structure.

(e) Maximum retention gained through the use of prefabricated pins which precisely fit the hole prepared for them.

Disadvantages

Some of the techniques described employ the use of autoseal resins which are still the subject of much controversy. It is felt, however, that the prefabricated pins provide sufficient retention to retain the materials or comparable materials.

923 Denman Street

The Influence of the Menstrual Cycle on the Rate of Tooth Movement During Orthodontic Treatment

ELSDON STOREY, M.D.Sc., Melbourne, Australia

DURING the first part of the menstrual cycle there is a significant decrease in the rate of movement of teeth, while during the second half of the cycle the rate increases, followed by a significant fall occurring before or at menstruation.

Controlling Factors

The movement of teeth is the result of resorption of bone and the factors controlling the cycle of tooth movement are associated with those controlling bone metabolism which is related to the rhythmic recurrence of the menstrual cycle. There is also a cycle of citric acid excretion associated with the menstrual cycle, the

peak of the citric acid excretion occurring approximately at the same time as the maximum rate of movement of teeth is observed, and it is considered that both cycles are related to the same cause, that is, an increased rate of resorption of bone and decreased formation which occurs at this time during the menstrual cycle.

Possible Hormonal Effects

This increase in rate of resorption of bone and decreased formation could result from an interference of the tricarboxylic acid cycle by some hormones acting at the same time as, or just before the time during the

menstrual cycle at which citric acid excretion reaches its peak.

The estrogenic hormones are known to interfere with the growth of bone, and as they reach their greatest level at a time when there is little formation of bone, it is probable that they are partly responsible for the bone changes observed during the menstrual cycle. As these hormones are under the control of the pituitary gland the cycle of variation in rate of resorption and laying down of bone (and movement of teeth) is due primarily to the rhythmic variations in cellular activity of the anterior lobe of the pituitary gland.

Adapted from *Australian Journal of Dentistry* 58:87 (April) 1954.

HYDROCORTISONE

in the Treatment of Oral Diseases

Associated With Emotional Stress

A. SULKE, D.M.D., and J. YARDENI, D.D.S., Jerusalem, Israel

DIGEST

After the publication of an article by Strean¹ in which he called attention to the possible role of cortisone in dentistry, several additional articles were published^{2,3,4,5,6} confirming the original observations and extending the use of cortisone therapy to include other oral diseases and oral manifestations of systemic disease. This article discusses the use of hydrocortisone acetate dental ointment 2.5 per cent in the treatment of various oral diseases confronting the dentist practising in an area where (1) the climate is warm, (2) the population is in a constant state of movement, and (3) the arriving immigrants are undernourished and many have been subjected to the stresses and horrors of war and concentration camps.

Symptoms of Emotional Stress

Most of the cases reported in this article are patients whose clinical signs seem to be associated with emotional stress. Such disturbances are not necessarily confined to inmates of con-

centration camps or to persons subjected to bombing raids. The dentist frequently encounters patients who show evidences of frustration resulting from disturbed family relationships, an overbearing employer or supervisor, unsatisfied ambitions, repressed aggression, or a chronic illness. The latter not only acts as an emotional stress factor but also produces physiologic stress.

Alarm Reaction—The mechanism involving the influence of stress on the pituitary-adrenal axis forms the basis of the General Adaptation Syndrome (G-A-S) of Selye. This investigator has shown that a stressor agent, emotional or physiologic, evokes a "call to arms" or the Alarm Reaction. This phenomenon represents mobilization of body defenses, mediated through the higher brain centers and the pituitary gland, in response to a stressor agent.

Adrenal Insufficiency May Result—As a result the adrenal cortex undergoes hypertrophy with increased secretion of hydrocortisone. If the stress continues, activity in the adrenal cortex is inhibited and hormonal secretion is reduced. With prolonged stress the adrenal cortex reaches a stage of exhaustion and body defenses may reach a critical level so that surgical intervention may lead to shock and death from adrenal insufficiency.

Occurrence of Oral Lesions—Emotionally disturbed patients or those suffering from nutritional deficiency or chronic illness usually possess hypopactive adrenal glands. Thus, the glands do not secrete sufficient hydro-

cortisone. As a result oral lesions become manifest because of the absence of sufficient hydrocortisone to control oral inflammation. In these cases, aphthous ulcers, cheilosis, lichen planus, and geographic tongue are common occurrences. It is believed that pyridoxine is lost in this metabolic process and this loss leads to dyskeratosis of the oral epithelium.

Results of Treatment Reported

Since hydrocortisone acetate is an antiinflammatory agent, an ointment containing this hormone was used for its specific therapeutic effect. Accordingly, hydrocortisone acetate dental ointment 2.5 per cent was used in the treatment of these patients. The ointment was applied three times per day and massaged into the affected area for a period of two minutes. The following case reports provide the essential details of treatment in twelve cases.

Case One—A woman of 45 suffered from chronic cheilosis. Treatment with hydrogen peroxide and silver nitrate failed to produce a favorable response. Systemic treatment with niacin was also ineffective. Administration of niacin was continued but supplemented by topical application of hydrocortisone acetate dental ointment 2.5 per cent three times daily. Within a period of three days marked improvement was observed. With proper dietary regime the ointment was discontinued without recurrence of the angular lesions.

Case Two—A woman aged 52 suffered from cheilosis, a desquamative form of dermatitis, and hypertension. Treatment with niacin and riboflavin was ineffective. Infected teeth were extracted and hydrocortisone acetate

¹Strean, L. P.: The Possible Role of Cortisone in Dental Medicine, *New York J. Dent.* **22**:102-104 (Mar.) 1953.

²Strean, L. P., and Horton, C. P.: Hydrocortisone in Dental Practice, *DENTAL DIGEST* **59**:8-16 (Jan.) 1953.

³Bain, A. M.: Desquamative and Pregnancy Gingivitis—A Suggested Theory and Treatment, *New York Dent. J.* **20**:18-20 (Jan.) 1954.

⁴Bergman, S. A.: Topical Application of Hydrocortisone Acetate in the Treatment of Aphthous Ulcers, *DENTAL DIGEST* **60**:60-61 (Feb.) 1954.

⁵Hoffer, H.: The Treatment of Procaïne Dermatitis with Topical Application of Hydrocortisone Dental Ointment, *J. Canadian Dent. Assn.* **19**:383 (July) 1953.

⁶Horton, C. P.: Hydrocortisone Acetate in the Treatment of Oral Inflammatory Disease, *New York J. Dent.* **25**:10-13 (Jan.) 1955.

dental ointment 2.5 per cent was applied three times daily over the affected area. After treatment with this ointment for one week a marked improvement in the affected areas was observed. The patient did not return for further observation.

Case Three—A man of 62 suffered from extensive cheilosis involving the upper lips. Treatment for more than a year with Benzentine®, Allersan®, Collyrin®, and argyrol was ineffective. Treatment with hydrocortisone acetate dental ointment 2.5 per cent for a period of two weeks produced clinical improvement.

Case Four—A man of 42 suffered from frequently recurring aphthous stomatitis for a period of two years. Previous treatment consisted of vitamins A, D, and B complex. The patient was then treated with hydrocortisone acetate dental ointment 2.5 per cent for a period of one week. Clinical improvement was manifest shortly thereafter and the patient was maintained with niacin.

Case Five—The patient, a woman aged 24, suffered from an ulcerative form of stomatitis covering the lips, cheek, tongue, and palate. Temperature and erythrocyte sedimentation rate were elevated. Hydrocortisone acetate dental ointment 2.5 per cent was applied three times daily for two days and supplemented by oral administration of hydrocortisone tablets, three tablets daily for two days. No improvement was observed. Routine treatment with antibiotics produced gradual improvement.

Case Six—In this case a woman of 65 developed denture palatitis after

receiving an acrylic denture. The inflammation persisted for three months despite treatment with niacin. Hydrocortisone acetate dental ointment 2.5 per cent was applied to the inner surface of the denture before insertion in the mouth. After two weeks the condition improved.

Case Seven—A male patient of 45 developed denture palatitis fourteen days after insertion of an acrylic denture. Application of hydrocortisone acetate dental ointment 2.5 per cent for three weeks, supplemented by oral administration of hydrocortisone tablets for four days (one tablet per day) proved ineffective. Rebasement of the prosthesis produced only slight improvement.

Case Eight—A woman of 28 developed pregnancy gingivitis and angular cheilosis in the third month of pregnancy. Topical application of hydrocortisone acetate dental ointment 2.5 per cent three times daily produced prompt relief. Gingival bleeding stopped and the papillae were markedly reduced in size. Although treatment was maintained irregularly, improvement persisted for the duration of the gravid period.

Case Nine—A man, aged 33, developed marginal gingivitis which did not respond entirely to instrumentation. Topical application of hydrocortisone acetate dental ointment 2.5 per cent for a period of one week produced immediate relief with gradual return to a normal condition.

Case Ten—Treatment with vitamin B complex was ineffective in the case of a woman of 54 who suffered from glossitis. Topical application of hy-

drocortisone acetate dental ointment 2.5 per cent for fourteen days produced only slight improvement. The patient was referred to medical service for systemic treatment.

Discussion

The ten cases cited emphasize the fact that cheilosis is a frequent occurrence in emotionally disturbed patients. The physiologic and emotional stress of pregnancy may also cause cheilosis and gingivitis. Hydrocortisone acetate dental ointment 2.5 per cent was effective in the majority of cases but some failures were encountered. These failures could be attributed to causes which require systemic treatment. Allergy to acrylic dentures is becoming more frequent and treatment with hydrocortisone is merely palliative.

Summary and Conclusions

A series of ten cases, most of which were diagnosed as angular cheilosis, associated with emotional stress, are presented. All were treated with hydrocortisone acetate dental ointment 2.5 per cent with prompt remission of signs and symptoms in the majority of cases. The two failures were probably due to acute infection of systemic origin. Hydrocortisone is a valuable aid in the treatment of recalcitrant diseases of the oral cavity.

34 Ben Yehuda Street

Authors' Note: The hydrocortisone dental ointment used was supplied through the courtesy of Lyon P. Strean, Ph.D., D.D.S., Medical Division, Merck & Co., Inc., Rahway, New Jersey.

Origin of Pain in Trigeminal Neuralgia

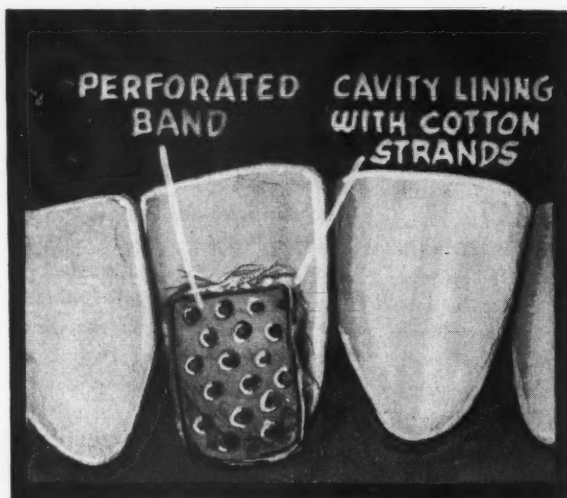
R. G. ROWBOTHAM, B.Sc., F.R.C.S.

HARRIS (1926, 1937) suggested that the pain of trigeminal neuralgia is of peripheral origin, because in an untreated case there is never any objective loss of sensation or evidence of trophic disturbance. He argued that if the pain were central in origin, peripheral nerve block or neurectomy would be unlikely to give relief. In many of

his cases the pain has followed difficult dental manipulations; and, because trigeminal neuralgia usually affects the lower two divisions of the trigeminal nerve (that is, the divisions that supply the teeth), he argued that the pain might be due to septic filamentous neuritis secondary to dental sepsis. He drew attention to the prevalence of right-sided neuralgia, and suggested this was possibly due to the fact that, in the right-handed majority, the teeth in the left side of the mouth were more thoroughly brushed than those on the right, with the result that sepsis was more frequent on the right side.

Adapted from *Lancet* No. 6816: 796 (April 17) 1954.

1



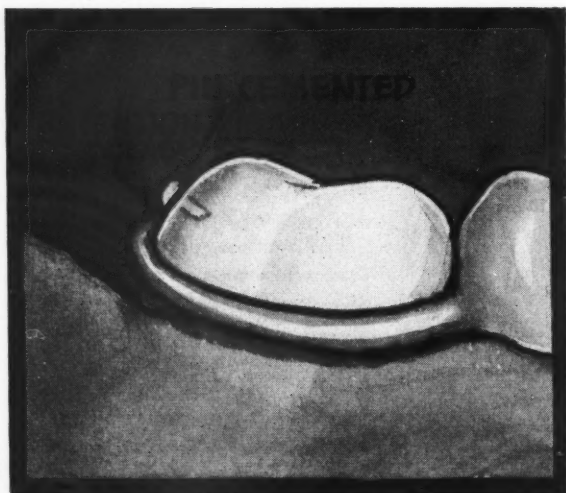
Clinical and Laboratory

Gingival Matrix

W. R. Nail, D.D.S., Dallas, Texas

1. Festoon a piece of perforated copper band. Paint the metal with a cavity lining liquid. Add wisps of cotton. Fill the cavity with hydrocolloid and insert the matrix. The cotton will allow the hydrocolloid to stick to the copper matrix.

2

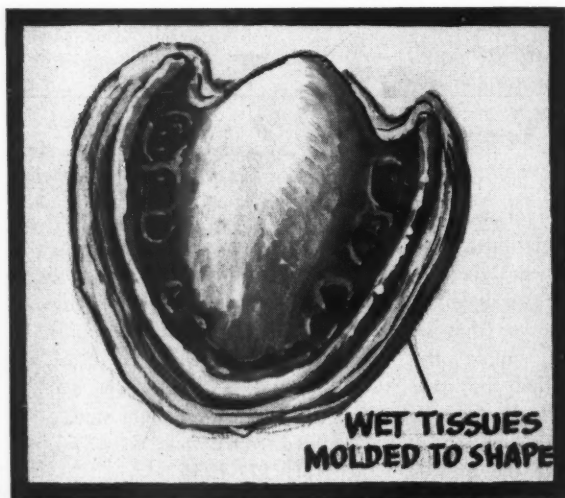


Improving Clasp Retention

Andrew J. Ackerman, D.D.S., New York

2. When a tooth is conical and does not afford retention for a clasp, retention can be obtained by drilling a hole in the tooth above the free end of the clasp and cementing a pin taken from an anterior denture tooth.

3



Boxing an Alginate Impression

Irwin M. Yarry, D.D.S., Woodside, New York

3. Fold several sheets of cleansing tissue lengthwise and wrap around the impression. Moisten with water and adapt to the proper form.

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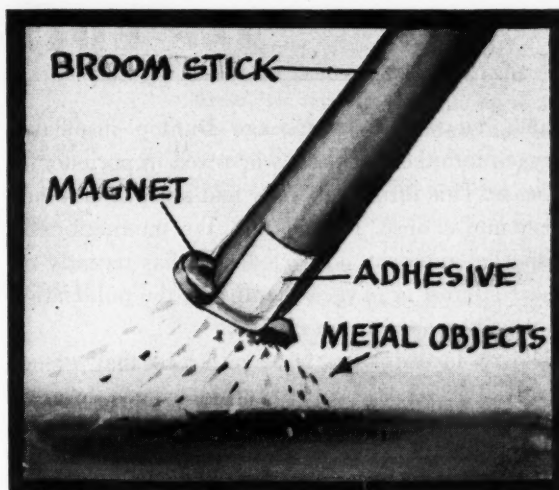
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

A Magnetic Retriever

Harry Maeth, D.D.S., Mosinee, Wisconsin

4. To recover burs, stones, or other objects made of steel from the floor, attach a flat magnet with adhesive tape to the end of a broom handle.

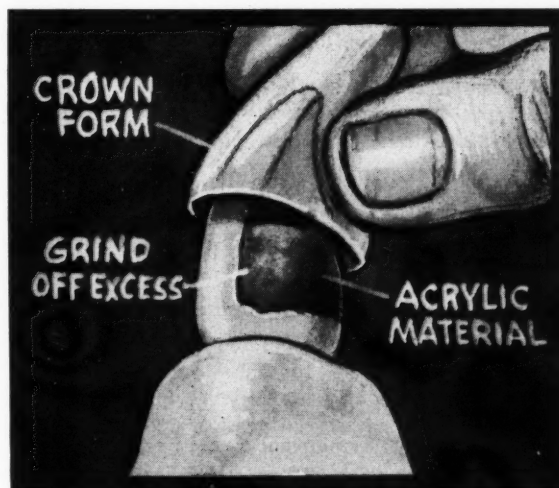


4

Direct Pattern for Three-Quarter Crown

I. S. Jacobson, D.D.S., Chicago, Illinois

5. Adapt a resin crown form to the tooth. Cut a small escape hole in the crown at the incisal. Fill the form with self-curing acrylic. When the acrylic has set, slit and remove the crown form. The plastic material is trimmed and contoured to make the pattern. If it is necessary, soft inlay wax may be flowed into the grooves and over the margins before the pattern is finished.

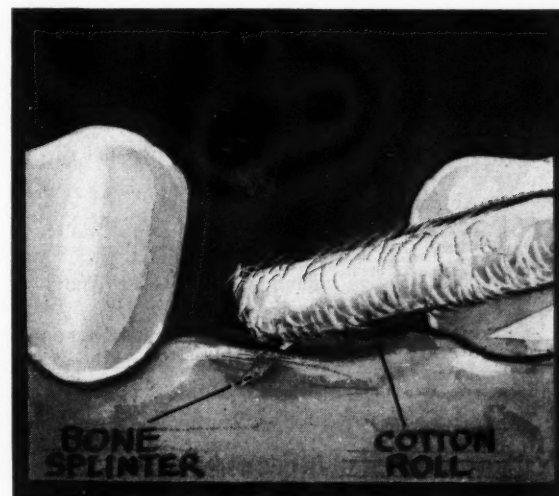


5

Removal of Bone Splinters

Cecil O. Garton, B.S., D.D.S., Inglewood, California

6. Dip a small cotton roll in topical anesthetic solution. Rub the cotton roll over the area where the bone splinters appear. The splinters will be picked up by the cotton fibers.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 466 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

MORE THAN forty years ago Dunlop insufflated oxygen into the soft tissues involved in periodontal disease. This form of therapy had a vogue and then went into eclipse. Harold Box, the internationally respected authority on periodontia, has recently revived interest in oxygen therapy by the publication of a monograph on the subject.¹

Many investigators have observed that tissues involved in disease are suffering from a form of anoxia. Inadequate tissue oxygenation is also a result of edema that chokes off the supply of oxygen from capillaries to the tissue cells. In this sense edema is a mechanical impediment to oxygenation. Tissue swelling is usually a part of the inflammatory response in the soft supporting tissues.

In 1940 Box wrote:²

"The return of gingival stippling, indicative, as a rule, of subsidence of local edema and a change of gingival colour from the various cyanotic shades to a fresh or rosy-pink, both indices of recovery to a state of health are almost invariably observed following insufflations of dry Dunlop vapour."

Dunlop vapour "consists of a dry gaseous mixture of oxygen and other ingredients including oil of peppermint, alcohol, and a yeast compound."

Causes

A. *Direct Factors*: Microorganisms and their toxins, enzymes

B. *Predisposing Factors*:

1) Local

- a) Traumatogenic occlusion
- b) Incubation zones
- c) Inadequate oral cleanliness

2) Systemic

- a) Presence of assisting causes:
 - (I) Gingival edema (nutritional disturbances)
 - (II) Gingival desquamation (nutritional disturbances)
- b) Absence of preventing properties:
 - (I) Lack of resistance to infection (nutritional and hormonal disturbances)
 - (II) Defective inflammatory response (nutritional disturbances)
 - (III) Imperfect maturation of connective tissue intercellular substance (nutritional disturbances)
 - (IV) Decreased anti-enzyme factor(?)

At present day most operators use USP medical oxygen alone for insufflation.

The rationale of oxygen insufflation would appear to be a valid attack against the anaerobic organisms that are present in the oral flora. On this subject of anaerobic infections Comroe and Dripps write:³

"The streptococci, which cause undermining lesions of the skin, such as Meleney's ulcer, or the spirochete or fusiform organisms causing Vincent's angina, are anaerobic. For these latter diseases, high oxygen is used therapeutically through the local application of zinc or hydrogen peroxide... Bacteriologists are uncertain as to why oxygen inhibits the growth of anaerobic organisms. One possibility is the inhibition of certain enzyme systems."

The use of oxygen insufflation would, therefore, appear to be helpful to tissue involved in the biochemical phenomena of inflammation as well as being a method of changing the behavior of anaerobic bacteria that are present in periodontal pockets and oral incubation zones.

In his monograph Box lists causes and treatments of periodontal disease and the indications for oxygen insufflation in this manner:

Treatment

A. *Direct Factors*: Scaling, ionic medication, packing, antiformin, oxygen insufflation, etc.

B. *Predisposing Factors*:

1) Local

- a) Occlusal adjustment, oxygen
- b) Eliminate incubation zones
- c) Establish adequate oral cleanliness

2) Systemic

- a) Enhancement of nutrition; vitamin therapy (ascorbic acid and vitamin B complex); oxygen for generalized gingival edema and inflammation
- b) Enhancement of nutrition with emphasis on certain vitamins (ascorbic acid) and on protein

¹Box, Harold K.: *Oxygen Insufflation in Periodontal Diseases*, Springfield Illinois, Charles C Thomas Publisher, 1955.

²Box, Harold K.: *Twelve Periodontal Studies*, University of Toronto Press, 1940, Chap. VII.

³Comroe, Julius H., Jr., and Dripps, Robert D.: *The Physiologic Basis for Oxygen Therapy*, Springfield, Illinois, Charles C Thomas Publisher, 1950.



Bacteremia

Bacteremias may be classified as continuous or intermittent. A continuous bacteremia always indicates serious infection. It often accompanies (1) bacterial endocarditis, (2) typhoid fever, and (3) brucellosis.

Transient bacteremia nearly always occurs during the onset of pneumococcal pneumonia. It accounts for the precursory shaking chill. Pneumococci in the blood denote spreading infection in the lung. When organisms can be grown from the patient's blood late in the disease, the outlook is not favorable.

Many transient bacteremias are the result of sudden showers of organisms into the blood stream and are of little consequence. Such episodes usually occur, without chill or fever, after manipulation of infected or contaminated tissues.

Bacteremia may be associated with (1) instrumentation of the genitourinary tract, (2) tonsillectomy, (3) dental manipulations, (4) incision of an abscess, and (5) even normal labor. Persons known to have valvular heart disease should be adequately premedicated with antibiotics before manipulation or operative procedures which might precipitate bacterial endocarditis.

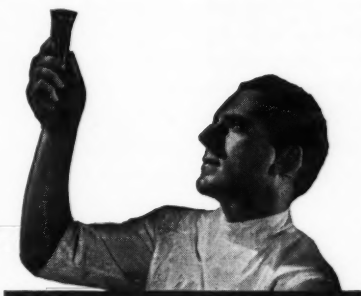
If the patient has intermittent chills, blood for culture should be obtained one hour before the expected time of the chill or elevation in temperature. A time lag exists between the sudden influx of bacteria and the onset of a chill. The blood is often free of bacteria before the fever begins.

Arterial blood cultures are not necessary when venous blood cultures are sterile because no bacteria are removed from the blood during passage through the extremities. However, with typhoid fever, histoplasmosis and brucellosis, culture of the bone marrow is more likely to yield a growth than is culture of the blood.

With the exception of brucellosis, the demonstration of specific antibody against an organism at a time

MEDICINE

and the Biologic Sciences



when that bacterium is cultured from the blood is pathognomonic of endocarditis.

When a bacteremia is recognized, therapy should be directed at the primary focus of the disease rather than the immediate administration of penicillin or some other antibiotic intravenously.

Bennett, Ivan L., and Beeson, Paul B.: *Bacteremia: A Consideration of Some Experimental and Clinical Aspects*, *Yale J. Biol. and Med.* 26:241-259 (March) 1954.



Barbiturate Intoxication

The barbiturates depress the central nervous system with little effect on the circulation or metabolism. However, there is a pronounced tendency to cause respiratory depression.

It is dangerous to use short-acting barbiturates in liver disease and the long-acting barbiturates in renal disease. One aspect of the action of barbiturates that is of special importance is that alcohol potentiates their action. Both the lethal and the anesthetic dose of a barbiturate are less if alcohol is present in the blood and tissues. Morphine also potentiates the

action of barbiturates on the respiratory center.

There is a great variation in the dose of a barbiturate required to induce anesthesia. The mean narcotic dose of amobarbital (Amytal) sodium is about 11 milligrams per kilogram, but the range is from 4 to 18 milligrams per kilogram. With most barbiturates there is, in a group of 100 persons, at least a fourfold difference between the dose required to give the same effect in the last and the most susceptible person.

The common symptoms of acute barbiturate poisoning are (1) drowsiness and confusion progressing to coma, (2) mild excitement, (3) ataxia and (4) slurring speech which often is mistaken as a symptom of alcoholic intoxication. Chronic intoxication may produce (1) vertigo, (2) ataxia, (3) diplopia, and (4) a galaxy of physical signs, so that neurologic syndromes are simulated. Mentally these patients often resemble chronic alcoholics.

Phenobarbitone is specially apt to produce severe and sometimes fatal skin eruptions. The eruption continues to spread when the drug is stopped.

The standard treatment of acute barbiturate intoxication consists in stomach wash-outs and the administration of picrotoxin or a similar analeptic. Penicillin is given as a prophylactic against hypostatic pneumonia. Patients must be carefully watched as the awakening effect of the analeptic is not sustained when doses well above anesthetic doses have been taken. After the initial stimulation, depression may follow.

Wayne, E. J.: *Pharmacological Aspects of Barbiturate Intoxication*, *J. Forensic Med.* 1: 172-174 (January-March) 1954.



Replacement Arthroplasty of the Hip

The most important postoperative consideration with replacement arthroplasty of the hip is relief from pain. Still, about one third of the patients have constant pain, alone or

with other complications, after such surgery.

Dislocation may occur whether the surgical approach is posterior, antero-lateral or antero-iliofemoral. Pre-disposition may be caused by (1) insufficient length of the femoral neck, (2) inadequate depth of the acetabular cavity or (3) excessive valgus placement of the prosthesis.

With one or more of these complications, dislocation is usually readily demonstrable at the time of surgery if the hip is placed in abduction and external rotation. In such cases, post-operative immobilization for at least three weeks in abduction and internal rotation is employed.

Superior subluxation, with migration of the proximal portion of the femur superiorly and often centrally, may be regarded as an abortive post-operative dislocation. Erosion of the subchondral bone of the roof and central portion of the acetabulum may be an accessory factor in superior subluxations.

Paracapsular calcification is sometimes caused by trauma from dislocation, but may occur without injury. Bone debris left in a wound after molding of the femoral neck can be a causative factor. Hip motion is reduced but calcification is not correlated with postoperative pain.

A fracture of the shaft of the femur may occur during placement of the prosthesis. Excessive force should not be used to accomplish reduction. Varus displacement of the prosthesis, sometimes not manifest until months after surgical treatment, may cause disabling pain and prevent weight bearing. Mechanical accidents are another source of complication. The prosthesis may fracture in the stem or over the skirt from a fall. Pain at the site of protrusion of the stem from the lateral cortex of the femur may be disabling. Local infiltration of procaine gives temporary relief in some cases.

The surgeon and, to some extent, the patient, should be aware of the many hazards involved in the operation.

Mendelsohn, Howard A., and Alban, Seymour L.: Complications in

Replacement Arthroplasty of the Hip, J. Bone and Joint Surg. 36-A:30-36 (January) 1954.



Cancer of the Tongue

Of all tongue cancers, more than half metastasize to cervical lymph nodes. Often combined treatment with low-intensity interstitial radium and roentgen ray is successful. Therefore, block dissection may be reserved for irradiation failures.

The same basic technique is employed for primary and metastatic lesions. Needles containing 0.66, 1.33, or 2.4 milligrams of radium are implanted in the tumor site for seven days. Between 6,000 and 12,000 gamma rays are delivered to the involved area. Supplementary roentgen therapy is used for the primary lesion only if a posterior location makes adequate dosage impossible. Radiation is always employed for metastases.

Any enlarged cervical lymph nodes are treated as metastatic. Biopsy of cervical nodes may disseminate the tumor. Needle biopsies are performed when diagnosis is doubtful. Manipulation of the nodes is avoided whenever possible.

The hazard of radiation sequelae is greatest from external sources because a large amount of tissue must be traversed by the rays. The mandible may be damaged by overenthusiastic prophylactic therapy of submental and submaxillary areas, occasionally necessitating jaw resections.

Proper precautions lessen radiation necrosis of soft tissue and bone. Treatment of primary and metastatic lesions is done in two stages, preferably six weeks apart. Irradiation areas are never allowed to overlap. Secondary surgery is performed for occasional small patches of necrosis or for local recurrences. A secondary block dissection may also be possible for an advanced growth without complete lymph-node regression.

The over-all five-year cure rate for one series of 98 patients was 32 per cent. Complete healing of the pri-

mary lesions was seen in 71.2 per cent of the patients. Of 56 patients with palpable cervical nodes 17.8 per cent survived five years. In only five patients was death attributed to distant metastases.

Martin, Charles L.: Treatment of Cancer of the Tongue and its Cervical Metastases with Irradiation, Southern M. J. 47:1-9 (January) 1954.



Heart Failure in the Elderly

Circulatory failure is essentially the same in patients of any age group. The underlying cause is a pathologic change in the heart due to various degrees of anoxemia. In older persons, the cause is arteriosclerosis, either alone or in combination with hypertension, rheumatic disease, or syphilis. Usually the heart is large.

The precipitating factors may be intrinsic or extrinsic. The chief intrinsic factor is diminished blood supply to the big heart. Extrinsic factors include (1) infections, (2) anemia, (3) pulmonary embolism, (4) physical and emotional strain, (5) transfusions, and (6) sodium-containing infusions. Social and economic conditions may also be precipitating influences toward heart failure.

In older patients venous pressure and circulation time should be measured. A prolonged circulation time in both venous and arterial portions usually indicates congestive heart failure. With severe anemia, normal circulation time denotes congestion.

The main principles of treatment do not differ with the age of the patient. Increased venous pressure is relieved by digitalis or digoxin in empirically calculated doses. Use of intravenous ouabain or strophanthin seldom has justification in an old person. In elderly men with urologic disease, mercurial diuretics may lead to acute retention.

Morphine subcutaneously or intravenously is safe but occasionally Cheyne-Stokes breathing is produced if the respiratory center is already depressed by arteriosclerosis. A combination of morphine and aminophylline is preferable if pulmonary dis-



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ease, congestive heart failure and arteriosclerosis are coexistent.

Eradication of the extrinsic precipitating factors is important. Valuable therapeutic adjuncts are the following: (1) antibiotics, (2) iron, (3) liver extract, (4) vitamins, and (5) an adequate protein intake. Also important is improvement of the social and economic situation.

Activity should be limited, but enforced invalidism is of questionable value. Residual cardiac edema may disappear when a patient becomes ambulatory.

Sonnek, P. J.: Congestive Heart Failure in the Elderly, Geriatrics 9:75-79 (March) 1954.

Contra-Angles



What Are You Reading?

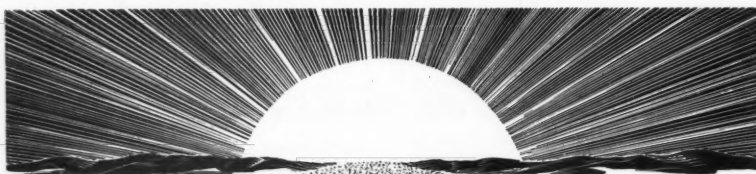
Can you keep up with your reading? If you are an average American dentist you are woefully in arrears in your reading. The first of the month, the time for bill-paying as well as for bill-sending comes too soon. With it comes the flood tide of mail carrying advertisements, magazines of general interest, and your dental journals.

From the welter on your desk what do you decide to read first? If you are an average American dentist you first use the "look through" method—the quick glance, then the motion toward the wastebasket for many of the advertising mailing pieces. Next is the "thumb through" of the magazines. Some of your publications are not even given the "thumb through." In fact, they never leave their mailing covers until they are thrown away. Some of your other journals have a kinder fate and receive a superficial reading. The articles in a few other cases are read thoroughly and reread. If anyone doubts that some material is examined with extreme care and attention, let him make a single mistake so small as a typographic error. We editors know that our mistakes do not die in obscurity but are brought promptly to our attention. That is as it should be.

Why are some dental journals read and others ignored? Why are some articles a sensation and others stir no ripple? There is no exact explanation. The more nearly an article touches the practical life and everyday world of the dentist, the more likely it is to be read. Articles on esoteric research and reports of obscure cases do not receive much reading interest. They seldom receive the attention that they are often entitled to receive.

(Continued on page 459)

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TRU-FORM PRIMARY CROWNS are only 30 cents each, introductory assortment of 100, \$30.00. Of course, like anything fine in the profession, they require definite operating techniques. For instance: You choose a crown that seems a little small and bell it around the occlusal with RM Posterior Crown Stretcher, so it will fit over the occlusal, Fig. 1. Next, to get the tight "snap fit" around the gingival, you crimp around the gingival with a 112 plier, (Fig. 2) and then finish with a 114 plier, (Fig. 3).



Fig. 1



Fig. 2



Fig. 3

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The impact of the printed word is wide in the frames of geography and time. Authors of dental articles of intense practical concern may be expected to receive responses from all over the world and often for years after their articles are published. That has been the experience of *DENTAL DIGEST* authors and I presume that it is the same for other publications.

Through publication a research worker or clinician receives recognition for the work for which he is entitled. Without publication his fame and influence are circumscribed within his own community. The printed word never dies and it has no spatial boundaries.

If publications in the dental field are to have vigor and life it is necessary that they be published in the atmosphere of free enterprise and competition. The publication that is subsidized by either a dental society or by a commercial enterprise does not have to stand on its own feet and pay its way. In the first case the dental society journal has a "captive audience" group of readers who are required as part of their dues to subscribe to the publication and free choice is not their privilege. The commercial enterprise that subsidizes a journal does so to sell its own products or services. There is certainly nothing wrong with either kind of publication so long as the reader is aware that one is a compulsory subscription and the other a form of advertising. In fact, some of the best publications in the dental world have been found in these two categories: *The Journal of the American Dental Association* is an example of the excellent society publication and the discontinued *Dental Cosmos* of one sponsored by a commercial interest.

An independent dental journal occupies a third category. It is required to sell subscriptions and advertising to keep in circulation. There is no dental society treasury to draw on to cover deficits and its advertising must be sold in a highly competitive market. An independent journal has neither a "captive audience" to sustain it nor a commercial interest to

(Continued on page 461)

In your ORAL HYGIENE this month

Get the Habit

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More Prescriptions



"It is evident that dentists should write more prescriptions," says Doctor Meyer Segal. "There is no doubt that in writing prescriptions we are conferring an appreciated service on our patients. It is a procedure that inspires confidence and respect, and gives prestige."

If you are not in the habit of writing prescriptions and have forgotten the conventional forms and terms which are usually employed, you can refresh your memory by reading this interesting article, for Doctor Segal not only tells you *why* you should write prescriptions, but explains just *how* to write them correctly.

★ ★ ★

Doctor Irving H. Goldstein warns that "No Complaints from the Patient" is not necessarily a sign that the patient is entirely satisfied with you or with your work. He suggests that you "begin to treat every patient—the old and not so old—just as if they were new patients coming to you for the first time," and to evaluate the work you have done on their mouths as though it was the work of some other dentist.

★ ★ ★

"Instead of investing money in General Motors or American Telephone and Telegraph, I am investing in myself and my own business," explains Doctor J. Broughton McCarthy in describing the recent renovation of his dental office suite. His plans may be adapted to almost any office, and his satisfaction with the result may encourage other practitioners to follow his example.

"Therapeutics and the Natural Look" reminds us that "A patient will tolerate annoyance and pain from a denture that 'looks good'" and "will appreciate and pay a higher fee for an esthetic triumph than for a balanced bite." the author, Doctor S. A. Allen, concludes that, while dentistry is basically a health service, it is often *esthetic* appeal that *sells* this service to the patient.

★ ★ ★

Do you have a quick rule-of-thumb to evaluate a new patient's credit rating? Ernest W. Fair gives you a credit-bureau table to help you judge a man's credit by his occupation. (Incidentally, dentists' credit rating is among the highest.)

★ ★ ★

"Tax-Exempt Municipal Bonds," while yielding less than other securities, may be a wise investment for dentists in certain income brackets. Nathan Belfer, of the Investors Planning Corporation, gives a list of such bonds with their recent prices and current yields.

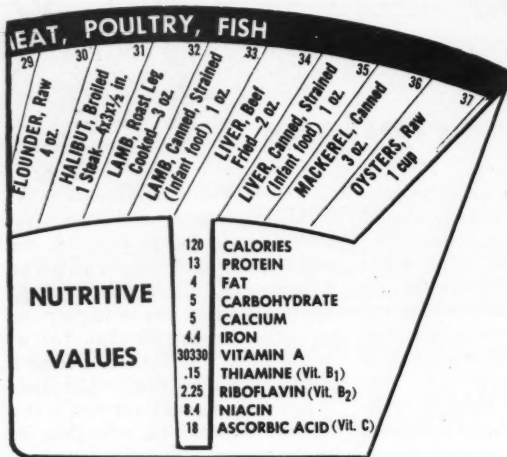
★ ★ ★

Doctor Robert P. Stickley is still giving excellent advice through "Wilbur," the dentist who knows all of the right answers. This sixth article in the series deals with investments.

★ ★ ★

Dentists might well borrow a good idea from industry and make a "Time-and-Motion Study in Dental Practice," according to F. Frazer who believes that "a high degree of efficiency with reasonable flexibility" would result.

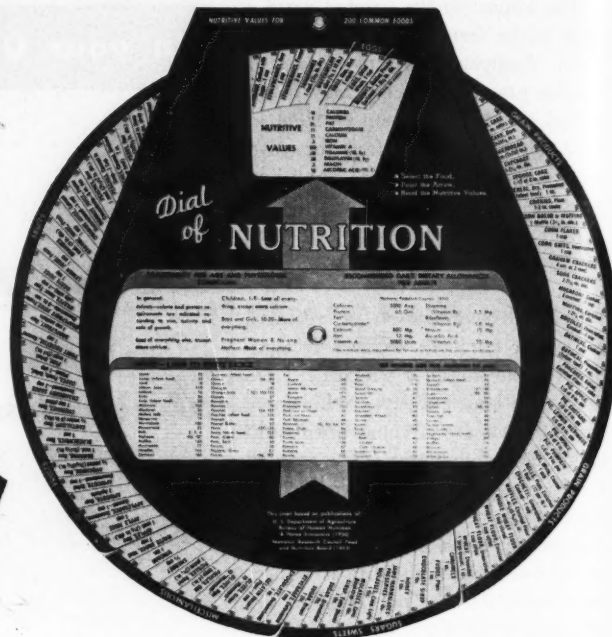
**Patients will thank you
For showing them how to
Dial their way
to HEALTH**



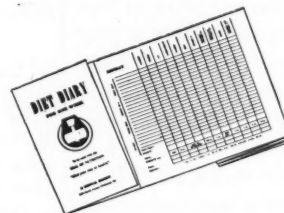
With diet the popular subject of newspaper columns, magazine articles, lectures, and books, the average layman is rapidly becoming nutrition-conscious. Unfortunately, he is also becoming nutrition-confused.

You can help the patient who is groping for food-facts (as well as the one whose dental or general health indicates a definite dietary deficiency) by recommending the simple and accurate DIAL-DIARY method of checking food intake in terms of nutritional needs.

The DIAL OF NUTRITION is an 11" movable disk, printed on both sides and mounted between two indicator panels so that 10 important nutritional components (and the caloric values) of 200 common American foods may be easily read. We have reproduced above, in full size, one of the two indicators you will find on each chart. You have only to select the food, point the arrow, and read the nutritive values which appear in the indicator slot.



The DIET DIARY is a convenient folder in which each item of food eaten at, or between, meals is recorded for the period of one week. The nutritional components of each food are determined by consulting the DIAL, and then entered in the proper spaces on the DIARY page. At the end of the day, or the end of the week, totals are checked against recommended dietary allowances. (All figures on the DIARY and the DIAL are those determined by the U. S. Department of Agriculture and the National Research Council.)



Gaining proper nutritional balance by correcting obvious nutritional deficiencies is then merely a matter of intelligent selection of food—and, again, the DIAL OF NUTRITION is a dependable and convenient guide. Three DIET DIARIES are sent with each DIAL OF NUTRITION.

Order a copy for your own use or enough copies for your practice. We shall be glad to quote discounts on quantities of 10 or more ordered at one time.

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support it. The independent publication must hustle.

The same situation prevails in medical journals as in the dental field and the *Medical Times* expresses the view in words of vigor—possibly words that are a bit too strong:

"Where competition, selection and merit rule we get worthwhile journals. It is to be borne in mind that many journals are organs of this and that group and that the articles which appear have been dumped into a hopper without much editorial choice. Here we have the realistic reason why there is so much fatuity in the ground-out product of innumerable mediocre groups, sometimes housed in marble walls, operating like pickle factories and of course producing edible pickles which poison nobody even if they possess no nutritional value.

"It is the independent journal, free from depressing entanglements, which is most likely to provide the highest grade of professional pabulum, including ideas. Shining examples will come to mind, though we confess that one has to turn one's mind backward for the best view. Unfortunately the general trend today is in the direction of dead hand organization control.

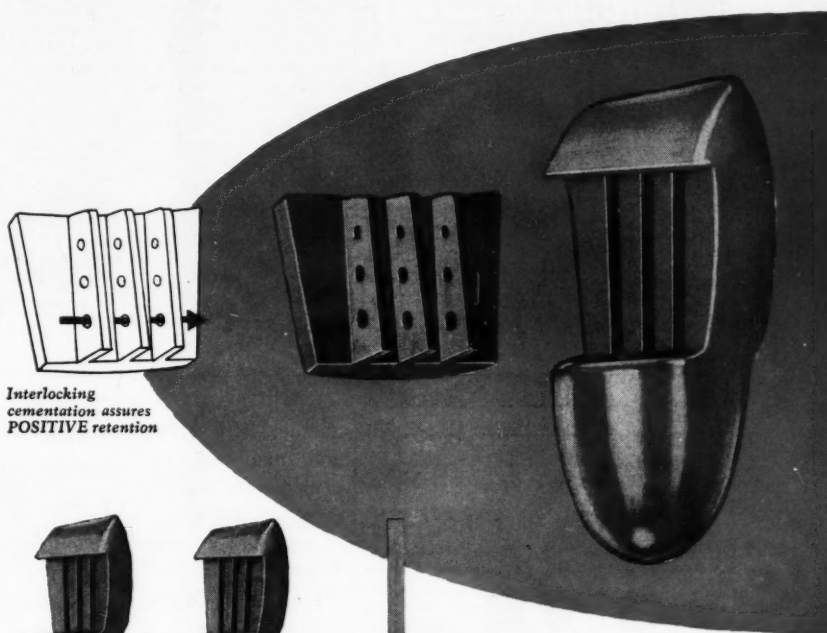
"If a journal is successful it is necessarily prosperous. This has nothing to do, in our view, with commercialism (of the type which always suggests dubiety).

"The independent journal is free to take an eclectic outlook on the whole fascinating world of medicine; it is able to dispense with restricting codes and rituals; it is not subject to the arbitrary jurisdiction of committees and commissars, confusing its tastes, opinions and performances; it is sufficient unto itself; it surveys the fields of medicine impartially, without prejudice; it encourages contributive talent without fear or favor; its aim is a product alive, challenging, stimulative, and culturally significant. These are some of its advantages in the competitive struggle."

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man. Or could it be good fortune not to worry? If we did not have things to plague us, we would make no efforts to accomplish anything. The hound of insecurity on our trail keeps us working. By working we give purpose to our lives and receive the satisfaction of some accomplishment.

I wish that I could give proper credit to the American psychologist who said "Worry is a spasm of emotions." I cannot give this credit for I do not know his name. But I can give

credit to Sir Winston Churchill who brought the expression to attention:

"A gifted American psychologist has said 'worry is a spasm of the emotions. The mind catches hold of something and will not let go.' It is useless to argue with the mind in that condition. The stronger the will, the more futile the task. One can only gently insinuate something else into the convulsive grasp and if this something else is rightly chosen, if it is really attended by the illumination of

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another field of interest, gradually, and often quite swiftly, the undue grip relaxes and the process of recuperation and repair begins."

In his own magnificent life Sir Winston Churchill has proved the value of "the illumination of another field of interest." At 80 he stands as an eminent success in journalism, literature, public speaking, and statesmanship; as a painter, a brick layer by avocation; as an oak of physical strength who has worsted the stresses of pneumonia and cerebral vascular accidents; as a man for stout brandy and black cigars. These fulfillments could never have come to a man who allowed himself to develop the "spasm of emotions."

—E. J. R.

Xeroradiography

**JOHN F. ROACH, M.D.,
and HERMAN E. HILLEBOE, M.D.,
Albany, New York**

The xeroradiographic plate which is the vital factor in the entire process, consists of a sheet of metal with a thin layer of selenium fused on one surface. The metal baseplate serves a dual purpose; it provides mechanical support for the photoconductive selenium, and at the same time acts as

an electric reservoir into which an electric charge may flow. To give mechanical protection to the plate and to enclose the selenium surface in a light-tight container, it is encased within a wooden frame and metallic cover slide constructed along the lines of the conventional photographic film holder.

Method of Use—To use the xeroradiographic plate, a charge is placed on the selenium surface by passing a group of wires, charged to a potential high enough to produce a corona about them, over the surface of the plate. This requires about 6,000 volts. The polarity and the geometric arrangement of the wires are such that the positive ions produced in the air are repelled by the wires and flow onto the surface of the selenium, where they deposit their charge. During this plate-charging process, the charging wires and their supporting structures are mechanically moved over the surface of the plate to provide a homogeneous surface charge.

Direct Function of Given Quantity of Radiation—If the plate is protected from radiation its charge will remain for a period of several hours with slight decay, since in the resting state selenium is an excellent insulator. If the plate is irradiated, those particles of selenium that are struck by the radiation become conductive and the positive charges that they had held on their surface are conducted through the selenium to the metallic baseplate, where they are homogeneously dissipated. Within certain practical limits, at any point the proportion of the total charge that is carried through to the baseplate is a direct function of the quantity of radiation that strikes that point.

X-rays Absorbed—It is readily seen that if an object is placed between the charged plate and the x-ray tube, some of the x-rays will be absorbed by the object in accordance with its size, shape, and radiodensity. The radiant energy that passes through the object will hit the selenium and dissipate its charge in conformance with the disposition and intensity pattern of the x-rays.

Electric Image Visible—At the completion of the x-ray exposure, a

portion of the original charge will remain on the surface of the selenium and this remaining charge will be in the form of an electric image representative of the size, shape, and varying radiodensity of the interposed object. The electric image becomes visible when a fine powder is sprayed on the surface of the selenium, granules of which are contrasting in color to the black selenium background.

Negative Powder Particles Attracted by Positive Charges—During the spraying process, the powder particles are electrically charged so that they have a charge opposite to that of the selenium. The result is that the negative powder particles are attracted to and held by the positive charges on the plate, and at any given point the quantity of powder deposited at that point is a function of the charge remaining at that point after the exposure to x-rays. At the completion of the spraying process an etching-like image in black and white is produced. This looks like a conventional radiogram from which a radiologic diagnosis can be made.

Features of the Process

1. After the xeroradiographic plate has been viewed, a permanent record can be made by transferring the powdered image to paper by means of an adhesive or an electrostatic technique.
 2. The selenium surface of the xeroradiographic plate is cleaned by brushing with a rabbit's fur brush that effectively removes any residual powder.
 3. The plate is then ready for another cycle of charging, exposing, powdering, viewing, and brushing. If ordinary care is used, this procedure can be repeated hundreds of times. Indeed, efforts to wear out a plate were discontinued after 2,300 exposures. At the end of that time no perceptible change had occurred in the image-recording power of the plate.
 4. It would appear that a dozen xeroradiographic plates, which one person can easily hold within his two arms, is sufficient to supply a radiographic installation every day for a
- (Continued on page 466)



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12 to 24 hours after brushing

PENETRATION AND STAINING
OF SODIUM DEHYDROACETATE

DENTAL FISSURE WITH
INITIAL CARIES



Tooth cross section showing red-stained sodium dehydroacetate in exposed protein of developmental groove (Schiff's differential stain).

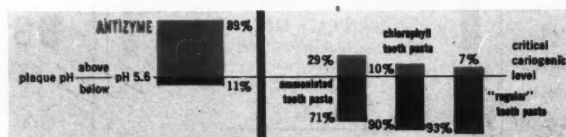
Histochemical studies at a leading dental research center prove sodium dehydroacetate is retained on dental plaque, on decalcified enamel areas, and in developmental pits and carious lesions, both *in vitro* and *in vivo*.

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pH control even after sugar rinse

12 to 24 hours after brushing

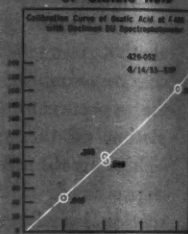
Although "regular" tooth paste provided pH control for only ½ hour, 9 out of 10 caries-active subjects using Antizyme Tooth Paste obtained continuous pH protection above cariogenic levels for 12 to 24 hours even after a 50% sugar rinse.



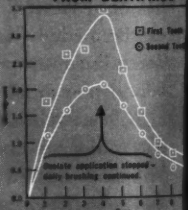
pH control after sugar rinse, 12 to 24 hours after brushing, proves Antizyme's protective action.

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Radioautograph of extracted human tooth after daily brushing with a tooth paste containing C^{14} labeled sodium oxalate showing oxalate deposits against the dark background.

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Enamel solubility reduction

Investigators have shown that certain ions reduce the solubility of tooth enamel. Among these are the fluoride ions and the less toxic oxalate ions. Some investigators found that when sodium oxalate was dissolved in an acid beverage tooth erosion was greatly reduced. Others reported that natural

oxalate-containing foods, such as spinach and rhubarb, produced a protective film on the molars of test animals within one week.

More recently, a study was made on human teeth *in situ*. In this study the uptake of oxalate from the dentifrice was demonstrated. (See graph).

Retention of oxalate confirmed by tracer studies

In a radioactive study on the transfer of sodium oxalate to teeth by topical application, radioautographs showed oxalate deposits and their location. These deposits *increased daily* as brushing continued. When brushing with the test dentifrice was discontinued, an apparently permanent deposit of oxalate remained in pits, cracks, and

lamellae of the enamel, although the amount on the intact surface of the enamel decreased.

This study confirms that the action of oxalate parallels that of the fluoride ions. Yet unlike fluorides, oxalate is safe even for children under six and even in areas where water supplies are fluoridated.

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(See pages 450 and 451)

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Subject: _____

Explanation of Procedure:

Sketch:

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month at the rate of 1,000 exposures per day.

Procedure Rapid—In addition to the features mentioned, the xeroradiographic process is a rapid procedure. It requires a total of ten seconds to charge a plate for exposure, expose it, and have the finished image for interpretation in less than two minutes. All the necessary equipment operates on 15-volt, 60-cycle current.

Small Space Required—The device is portable and requires no more space than is provided by the top of the usual hospital stretcher. Since the equipment is not injured by primary or secondary radiation, it can be used within the ordinary radiographic room, provided the xeroradiographic plate is charged before each exposure.

Resolving Power Exceeds Conventional Film—It is gratifying to find that the resolving power of the xeroradiographic plate is not less than that of conventional film but actually exceeds it. We have made x-ray images of test objects, such as fine wire screening, on both film and xeroradiographic plates, and find that when using the film in cardboard holders definition is seriously lost as a mesh of 180 lines to the inch is approached; whereas, at this mesh size the grid pattern is quite clear on the xeroradiographic plate. It is xeroradiographically possible to record a test pattern as fine as 1,200 lines to the inch.

Image of Low Contrast—The wide extremes of contrast that are available in x-ray film are not found in xeroradiographic plates. Step-wedge measurements show an easily detectable gradation of contrast over a wide range of voltage and wedge thickness. With the powder that is now being used, an image is obtained of low contrast in which, unlike conventional film, both the radiodense and radiolucent portions of the image are shown. Thus, in an exposure of the skull and neck in the lateral projection, such widely differing structures as the skin, subcutaneous fat, laryngeal structures, cervical vertebrae, mastoids, and calvaria are all seen with clarity.

Greater Exposure Used—At the

present stage of development, the speed of xeroradiographic plate leaves much to be desired; the plates are slightly faster than film in cardboard holders. As a result, to make xeroradiographs of the heavier parts of the body, such as the abdomen, pelvis, or spine, it is necessary to use an exposure considerably greater than is required to produce a satisfactory image of the same part on x-ray film when used with the conventional intensifying screens. It is, of course, desirable to reduce exposure to the patient to a minimum.

Routine Clinical Possibilities

Although the manufacture of the plates is a difficult procedure, size is not a critical element, and no difficulty along that line is anticipated. Although interest in xeroradiography was first aroused because of civil defense medical services, the authors have been impressed with the possibility of using the method in routine clinical radiography. In the past nine months a clinical survey has been conducted to provide statistical proof of the relative efficiency of xeroradiographs and standard roentgenograms. This study, which will be published soon, shows a high degree of correlation between the two methods. The radiologist may soon have a powerful diagnostic tool that will enable him to serve patients with greater speed, economy, and precision.

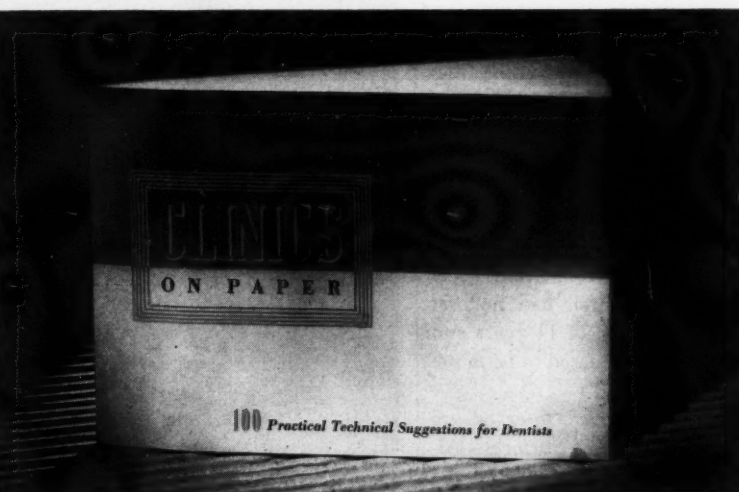
Adapted from *Journal of the American Medical Association* 157:899-901 (March 12) 1955.

The Caries Experience Rates of 12-, 13-, and 14-year-old Children After Exposure to Fluoridated Water for Fifty-nine to Seventy Months

IDEN N. HILL, D.D.S., J. R. BLAYNEY, M.S., D.D.S., and WALTER WOLF, M.B.A., Chicago

Discussion

When sodium fluoride was added to the Evanston, Illinois water in 1947 the 12-, 13-, and 14-year-old children were 7, 8, and 9 years of age, respectively, with the crowns



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Results expected—It was logical to assume that the greatest reduction in dental caries probably would be found in the 12-year-old group as the cuspids and second molars are usually in the final stages of eruption at about the twelfth year and thus could experience the longest pre-eruptive period after fluoridation.

Equal Reduction in 12- and 13-year-old Group — Although the crowns of the permanent dentition were formed at the time fluorine

of their cuspids, bicusps, and second molars fully calcified. For from one to five years prior to eruption, the enamel of the crowns of these teeth was exposed to tissue fluids containing the F ion.

was placed in the water, these teeth were exposed to tissue fluids containing fluorine during the pre-eruptive and eruptive stages. The dental caries reduction found in the 12- and 13-year-old group being approximately equal may be attributed to the fact that at the time of examination the cuspids and second molars of some of the 12-year-old children had not yet erupted. (A child of 11 years and 6 months is considered to be in the 12-year-old group.)

Carious Lesions Observed on One-half Occlusal Surfaces—Although the particular teeth of the 13-year-old children were erupted, they may not have been exposed to the oral environment a sufficient length of time for caries to develop. Boyd and Wessels¹ observed carious lesions on one-half of the occlusal surfaces of second molars of forty-nine girls and boys within one year after eruption and on three-fourths of the surfaces within eighteen months.

Significant Change in Rates

While considering the occlusal surfaces with and without pit and fissure caries or fillings, a decrease was noted in the caries experience rates and an increase in the number free from carious experience; however, the changes were not equal. It is felt that until the rates are expressed as per hundred teeth or per hundred surfaces, noting the total number of surfaces present, the imbalance will remain. However, the changes in rates were considered significant.

Maxillary Anterior Rates—The caries experience reductions in the maxillary and mandibular anterior teeth, although quite consistent, were not considered to be too important. The numbers of affected teeth in both the maxillary and mandibular sections were so small

¹Boyd, J. D., and Wessels, K. E.: Variability of Progression of Dental Caries on The Occlusal Surfaces of Second Permanent Molar Teeth. Dept. of Pediatrics, State University of Iowa, Iowa City, Iowa, Personal Communication.

that only the reduction in the maxillary anterior rates of the 12- and 13-year-old children were considered significant. The reduction found in the 14-year-old group probably could happen from year to year as a normal fluctuation. None of the changes affecting the mandibular teeth was significant.

Permanent Tooth Surfaces with Pre-carious Lesions—The rates for this classification were somewhat baffling for the 12-year-old group.

There was a reduction from the 1946 rate, but the 1952 rate was higher than the rate found in 1949. The increase from 1949 was considered to be significant as was the decrease of the 1952 rate from 1946.

Cases Immune to Dental Caries—At the time of examination in 1952 these cases indicated an increase of 89.59 per cent for the 12-year-old children, 139.21 per cent for the 13-year-old students, and a

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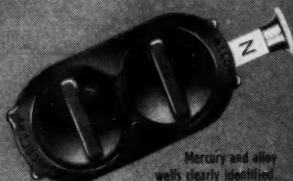
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reduction of 61.39 per cent for the 14-year-old children. The increase for the 13-year-old pupils was considered to be significant. The fact that the changes for the 12- and 14-year-old groups were not significant was attributed to the small number of immune cases found each year.

Summary

In considering the changes in decayed, missing, and filled rates,

the DMF rates per hundred children, per hundred teeth, and per hundred surfaces all give about the same percentage reduction.

The maxillary anterior teeth decayed and filled rates were reduced about 23 per cent for the 12- and 13-year-old children, while the reduction for the 14-year-old students of 9.06 per cent was not considered significant. The mandibular anterior teeth rate reductions were not significant.

The increase in immune permanent dentitions was statistically significant only for the 13-year-old groups, and here an increase of 139.21 per cent was noted. However, the increase was only 1.42 cases per hundred children when 1952 was compared to 1946.

The percentage reduction change in the dental caries rates for the 12-, 13-, and 14-year-old children after exposure to fluoridated water from fifty-nine to seventy months was approximately 18.51 per cent for the combined ages. This reduction is considered to be statistically significant. The reduction to date appears to be approximately 4 per cent for each year of fluoridation.

Adapted from *Journal of Dental Research* 34:77-88 (Feb.) 1955.

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